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CLINICAL EFFECTS OF SURGICAL AND X-RAY CASTRATION IN MAMMARY CANCER

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A consideration of the value of castration in relation to cancer of the breast is one which periodically has presented itself to the medical profession for a period of fifty-five years since its suggestion by Schinzinger in 1889. The work of Huggins in cases of cancer of the prostate has again brought up for review the subject of castration in cancer of the breast. It may be recalled in Huggins' work that the total effect of castration of the male was not obtained when castration was carried out by x-rays. He obtained his effects by surgical castration, and this is the reason for bringing up at this time a reconsideration of the subject of x-ray castration versus surgical castration.

This study represents a review of all the patients with carcinoma of the breast who have been castrated with surgery or radiation in a period of eighteen years at the Memorial Hospital in New York City. All the women considered in this series for effect of castration on the course of mammary cancer are selected carefully to include only those who have functioning ovaries. Patients are included up to 55 years if they were having regular menstrual periods. If those under 45 years have had a hysterectomy or ceased menstruation for any reason, they were excluded from this series.

Often the castration was performed for reasons unrelated to the mammary cancer, such as menorrhagia caused by fibromyomas of the uterus or for a carcinoma of the cervix. The total number castrated was 342: 335 women and 7 men. Of the women 31 were surgically castrated and 304 received high voltage x-radiation or intrauterine radium in sufficient amount to stop the ovarian function.

From the Breast Department of the Memorial Hospital.

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On account of the length of the paper, the entire review of the literature together with the bibliography and other matter is deleted but will be found in the authors' reprints.

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REVIEW OF LITERATURE

The experimental literature on the subject of castration in animals is enormous and, unfortunately, most contradictory. With the exception of a few outstanding points in the experimental field, a review of the work of the experimentalists leaves one somewhat unconvinced.

For the sake of estimating the value of castration we considered the results as susceptible of being placed in one of three groups: (1) improved by castration, (2) uncertain as to improvement by castration, (3) not improved by castration.

The criteria for consideration as to improvement were (1) the presence of axillary nodes, (2) pregnancy, (3) age of the patient, (4) grade of malignancy of the tumor, (5) duration of life following castration and (6) course of the disease following castration.

We hold that it is improper to consider that the patient received any benefits by castration if the course of the disease was not materially changed or if the patient died within a two year period following castration. However, if the patient lived more than two years after bone or soft part metastasis we then classified that patient as having received benefit from castration, provided the patient had no axillary involvement at the time of the operation. In other words, if the patient had no axillary involvement that patient had at least a 75 per cent chance of cure anyway. If the patient has had only a year or a year and one-half following castration when there appeared to be some improvement in the clinical course, that patient was placed in the group "uncertain as to improvement."

Analysis of the 335 women castrated reveals that of the 304 castrated by x-rays 47, or 15 per cent, according to our criteria, were improved, 57, or 19 per cent, were in the group uncertain as to improvement and 200, or 66 per cent, were not improved by castration. Of the 31 patients surgically castrated 4, or 13 per cent, were in the improved group, 7, or 23 per cent, were in the uncertain group and 20, or 64 per cent, were in the unimproved group.

It will be noted from the study of table 2 that women castrated by surgery or by irradiation methods appear to have approximately the same result as far as improvement goes, namely 15 and 13 per cent. Those definitely not improved were 66 per cent by x-rays and 64 per cent by surgical castration. It is obvious that, in order for us to make this comparison a proper comparison, we should have a greater number of surgical castrates. The analysis of improved cases according to age groups shows that among the 51 improved patients in the entire series 33, or 62 per cent, were 40 years of age or less.

During the course of this analysis we have written to twelve outstanding radiation therapists for their opinions on the value of castration in mammary cancer,

and the average of their combined opinions was that castration was of value in approximately 20 per cent of the cases. In contrast to this opinion our 304 patients castrated by the x-rays gave a 15 per cent improvement. However, it is quite possible that of the "uncertain" group some would eventually be added to the improved group, making the 15 per cent a little higher. The same holds true with the 13 per cent improvement in the surgical group. It should be here stated that an exact evaluation of improvement is a very difficult matter for one to determine. Owing to the vagaries of the cancerous diseases and because of the human soil in which the cancer grows and as the result of many other factors, evaluation of castration will always remain out of the realm of exact scientific evaluation. On the other hand, one may obtain a general idea of the value of castration on purely clinical grounds. Unfortunately one cannot predict which case will receive benefits and which case will not. From our studies it would appear that the sum total of improvement amounts to approximately 13 to 15 per cent in women. It should be here repeated that this applies to women who still menstruate and does not include those who are past the menopause. A study of the value of castration in women past the menopause should be made.

It has been of some interest to note that approximately one third of the patients castrated surgically showed metastatic disease present in the ovaries at the time of microscopic study. Unquestionably there are instances in which a patient castrates herself by metastatic disease. In 1 of the most striking instances in our experience, reported by Hoffman in the *Surgical Clinics of North America,* self castration was responsible for the spectacular change in the clinical course of the disease. The patient was a private patient of one of us and was rapidly losing ground from local recurrence about the operative wound and from metastatic disease including large nodules on the scalp as well as pelvic bone metastasis. Her clinical course changed, she gained 50 pounds (23 Kg.) and had a complete improvement in general health, which was maintained for about a year and a half. She then started downward, death coming within six months. At autopsy both ovaries were completely replaced by metastatic disease. This entire subject of castration must be considered also in the light of what may take place in the adrenals following castration. In laboratory animals there is evidence that the ovarian function is taken over by the adrenals, and it is possible that this same effect may take place following oophorectomy in the human being, which may help to explain the temporary nature of the improvement that takes place in castrates.

TABLE 2.—*Castration of 335 Women with Carcinoma of the Breast*

Course of Disease	Radiation		Surgical Castration	
	Number	Per Cent	Number	Per Cent
Improved	47	15.4	4	12.9
Uncertain as to improvement	57	18.8	7	22.6
Not improved	200	65.8	20	64.5
Total	304	100.0	31	100.0

We recognize that castration is a very disturbing procedure both mentally and physically for any young woman. It upsets her career as a woman, so that the procedure should not be taken lightly. On the other hand, if it saves lives it is worth the ill effects. In our clinic we have attempted to make a sharp line of indication for castration. For example, we castrate by x-rays any young woman with breast cancer which involves the axilla or which has metastasized to a distant part or has recurred locally. We do this because we recognize that any such case is a desperate one. We do not castrate a young woman if at operation a study of the axillary contents proves it to be negative for metastasis and, on the other hand, if the patient has passed her menopause we do not give a castration dose even though the axilla is involved. However, this problem must be further studied. Unquestionably the function of the ovary does not cease at once with the cessation of menstruation and it is highly probable that some women will receive benefit by ovarian irradiation, even though the menopause has been passed.

TABLE 3.—*Results in 304 Cases in Which Castration Was Done by X-Rays or Radium*

Indication	Course of Disease			
	Improved	Possibly Improved	Not Improved	Totals
Bone metastases	28	27	126	181
Primary castration	9	10	5	24
Lung or liver metastases	2	3	10	15
Local recurrence	6	4	16	26
Carcinoma of cervix	0	0	4	4
Menorrhagia from fibroids	1	7	24	32
Following pregnancy	1	3	7	11
Metastases to ovaries	0	3	8	11
Total	47	57	200	304

The patients receiving high voltage x-ray treatment to the pelvis are analyzed to show why castration was carried out. A considerable number had this treatment for pelvic complications at a time when the mammary cancer was assumed to be under control; consequently, although patients may be alive many years later, the result will be given here as "no improvement." Table 3 analyzes the 304 cases in which castration was done by high voltage x-rays or radium, according to the reason for this treatment. Each group will be analyzed separately, with illustrative cases.

CASTRATION FOR BONE METASTASIS

By far the largest group of young patients with carcinoma of the breast had castration with high voltage x-rays for the treatment of bone metastasis incidental to the treatment of metastasis in the pelvic bones. The total number was 181. Of this total 126, or 70 per cent, had no appreciable improvement attributable to castration. Fifty-nine, or 47 per cent, of those unimproved lived only six months or less after castration, and 45, or 36 per cent, lived from six to twelve months. Only 22, or 17 per cent, lived twelve months or over, and these were not improved clinically, having continued extension of the bone metastases and extreme disability.

A small number, 28, or 15 per cent, had definite improvement following the administration of a castrating dose of radiation therapy to the pelvic region, and the duration of life was over five years in 5 patients, from four to five years in 1, from three to four years in 5 and from two to three years in 17. These patients had well defined clinical improvement with relief of pain, some with radiologic evidence of healing of the bone, and in some instances life was prolonged in spite of the advanced stage of the carcinoma. One patient is still living and well today eight years after roentgen castration whose radical amputation for a

grade 3 carcinoma of the breast was carried out ten years ago. She had bone metastasis two years after the treatment for a primary operable carcinoma at the age of 36 years. Another patient who lived six years after castration died of a coronary occlusion. Two other patients are still well with no demonstrable carcinoma two years after castration.

An equal percentage, 15, or 27 patients, who were clinically improved after roentgen castration for bone metastasis may possibly have received this benefit from castration. A number of these patients are still living and have no symptoms. The duration of life was over five years in 3 patients (2 still living and well), 3 years in 1, from two to three years in 2, from eighteen to twenty-four months in 6 and from twelve to eighteen months in 15.

PRIMARY CASTRATION

This group is termed primary castration because a cycle of high voltage roentgen therapy was used as part of the initial treatment of the mammary cancer when the patients applied for treatment. The patients included in this group were young women, 67 per cent 40 years of age or less, who either had advanced operable carcinoma with axillary lymph node involvement or inoperable carcinoma or had been maltreated for operable carcinoma, such as, for example, by repeated local excision of the cancer in the breast.

Although not a large group, 24 in all, 37 per cent of these patients showed improvement beyond the expected history of the individual case, having lived three and one-half to fourteen years after castration. An additional 41 per cent were possibly benefited by this treatment; that is, 78 per cent of the total showed clinical improvement which may or may not be attributed to x-ray castration. This is a small group and the patients were selected for this in a rather desperate chance, as may be judged by the following case:

A woman aged 31, who applied to the Memorial Hospital for treatment on March 9, 1938, gave a one year history of an inverted nipple and a lump in the right breast. Because of her age and lack of axillary involvement, several attempts were made without success to prove the diagnosis by aspiration biopsy and excision of skin nodules. A short cycle of high voltage x-radiation was given to the breast and three weeks later a simple mastectomy was performed. The pathologist's report was infiltrating duct carcinoma, grade 3, with metastases in the skin. Within a short time a mass appeared in the opposite breast and a month after the first operation a left radical mastectomy was done, removing the same type of carcinoma with metastases in the axillary nodes. Within the next two months, right axillary nodes became enlarged and the tissue from an axillary dissection contained seven nodes which the pathologist reported as replaced by metastatic carcinoma, grade 4.

High voltage roentgen therapy had been given to the pelvis in March of 1938 at the time of the first treatment (therefore termed "primary castration") and a heavier cycle was given in September of 1938 after the three operations described. Postoperative roentgen therapy was also given locally to the axillas and chest wall. Another cycle of pelvic x-radiation was given in 1941 for bone pain. The patient was living and well with no evidence of recurrence or metastasis when last seen, Dec. 2, 1943, over five years after castration and initial treatment.

LUNG OR LIVER METASTASES

Fifteen patients with carcinoma of the breast metastasizing to the lungs or liver or both received pelvic x-radiation in large enough amounts to produce cessation of the menses. This was given as a last resort to patients who seemed to require some form of palliative treatment. Two patients seem to have improved after castration in spite of radiographic evidence of pulmonary metastases. They are still living five years and nine years after castration, though symptoms of metastases have recurred. Three other patients may have had their lives prolonged by the castration produced by x-radiation. They had relief of symptoms and lived more than a year after diagnosis of lung or liver metastases and castration. The remaining 10 had no change in the usual rapid downhill course, with death in a few months.

CARCINOMA OF CERVIX

Four patients with carcinoma of the breast developed carcinoma of the cervix uteri. All were diagnosed by biopsy as having epidermoid carcinoma, which was a second primary carcinoma in each instance. The time interval from treatment of the mammary cancer until development of the cancer of the cervix was one and one-half years, eight months, six years and five years, respectively. One patient lived nearly three years after treatment of the second cancer and died of pelvic extension of the carcinoma of the cervix. Her mammary cancer had not recurred, although it was nearly nine years since she had had a radical mastectomy for a "low grade infiltrating tubular carcinoma of the duct and foci of sweat gland adenoma and sclerosing abortive adenomatosis, somewhat atypical and suggestive of further foci of neoplastic growth." She was 44 years of age at that time, and there was no axillary node involvement. In none of these cases did the castration, in our opinion, affect the course of the mammary carcinoma.

MENORRHAGIA CAUSED BY FIBROMYOMAS OF UTERUS

A total of 32 patients treated for carcinoma of the breast had radiation castration for menorrhagia caused by fibromyomas of the uterus at some time in the period of treatment or observation. Only 1 of these, or 3 per cent, is judged to have had any benefit from the cessation of ovarian stimulation:

This patient, L. V., aged 36, had an operable carcinoma after local excision elsewhere five weeks before. She had a radical mastectomy performed, and the axillary lymph nodes contained metastases. Heavy postoperative external radiation was given with the radium pack locally. The following year she had local recurrences treated successfully with more external radiation. Two years later pelvic x-radiation was given because of the presence of large fibromyomas of the uterus and menorrhagia. She was improved after this and required no further treatment until six and one-half years later, when there was bone destruction in the spine and extension of carcinoma in the cervical lymph nodes. She survived another year, a total of eleven years after the original treatment and nearly eight years after castration.

The 7 patients (22 per cent of 32 treated for fibromyomas) who are listed as possibly improved had treatment within a short time after treatment of the mammary cancer and are alive several years later (two to ten years) or lived for several years after castration, dying of carcinoma.

Unimproved by castration in this series were 24 patients, or 75 per cent. Most patients lived four or more years after castration but, because the mammary cancer was apparently adequately treated, the course is considered to be uninfluenced by the ovarian dysfunction.

CASTRATION FOLLOWING PREGNANCY

Twelve patients had pregnancy complicating the course of carcinoma of the breast. The pregnancy occurred either with the primary carcinoma or follow-

ing the treatment. Eleven patients were castrated with high voltage x-radiation after the termination of the pregnancy by abortion or delivery. The twelfth had surgical castration and is included in that group in the tables. This case is very interesting and may be reviewed briefly:

S. Z., aged 34, who was admitted to the Memorial Hospital Dec. 29, 1928 with a history of a caked breast following the weaning of her youngest child two years before, had noticed a swelling the size of a hen's egg in her left armpit in October 1928 and redness and swelling beneath the left clavicle. Her local physician gave her "baking treatment" and the swelling subsided somewhat. When examined she was found to have extensive involvement of the left breast, chest wall, axilla and supraclavicular region with a carcinoma which was hopelessly inoperable. She was treated with high voltage roentgen therapy combined with radium pack and radon gold seeds to the breast, axilla and lower neck, with some regression of the tumor. In 1930 she was found to have a large pelvic mass, and in February 1930 a laparotomy was performed and the uterus, both ovaries and oviducts were removed. The uterus contained an embryo 3 cm. long, and one ovary was destroyed by a tumor which was diagnosed as metastatic tubular carcinoma of the breast. On March 16, 1931 a simple mastectomy was performed because of an increasing mass, and the tumor, 4.75 by 2.0 by 3.0 cm., was a cellular bulky adenocarcinoma. The patient was well for over a year but developed local recurrences on the chest wall extending to the opposite breast and died Nov. 20, 1932, almost four years after primary treatment and two years and eight months after surgical castration.

Of the 11 patients who had castration doses of radiation to the pelvis following pregnancy, 7 lived less than a year, during which time there was rapid progression of the mammary carcinoma. Three had longer survival, which we think may have been influenced by the castration, since further disease had developed, indicating lack of cure. The survival following castration was two years, four and one-half years and eight years, respectively.

One patient is listed as definitely improved by castrating effect, since she had an early pregnancy during the course of preoperative radiation therapy. Radical mastectomy proved the presence of carcinoma with axillary node metastases. Postoperative pelvic x-ray therapy caused abortion and castration. She survived three years longer.

TABLE 4.—*Results of Orchiectomy in 6 Cases*

Case	Clinical Classification	Mammary History	Pathologic Condition	Physical Findings on Admission	Treatment	X-Ray Studies	Date of Castration	Pathologic Report on Testes	Course
1. M. S. Age 72 White, Italian-Catholic. Married, 2 children. Date of admission, 4/28/41	Primary inoperable, left	Ulceration of nipple for 4 months; mass 5×6×2 cm.; axillary nodes	2/9/42: formal biopsy; infiltrating carcinoma, grade 2	Areola and nipple destroyed; stayed away for 9 months after mastectomy was suggested	None except orchiectomy	4/30/41: negative 1/30/42: widespread 5/28/42: rib fractures healed 6/17/42: calcification 6/22/42 continued 8/24/42 improvement 3/17/44: no change 5/25/44: ? reactivation	2/9/42	Atrophy and interstitial cell hyperplasia	Remarkable clinical regression of primary lesion with regeneration of bone; blood chemistry returned to normal; question of relapse
2. J. S. Age 75 White, English-Protestant. Married, 6 children. Date of admission, 6/10/41	Recurrent inoperable, right	Lump for 1 year, 6×4 cm.; nodes in axilla	7/1/43: infiltrating carcinoma, grade 3; node metastases, multiple	Lesion ulcerating; nodes involved	Radical mastectomy 7/1/41: estrogen 228,000 mouse units 7/23; orchiectomy 8/18/42	2/26/42: skull positive 3/27/42: ribs, spine, pelvis 6/20/42: widespread 7/17/42: increased 12/28/42: right lung increased	1/27/42	Testes slightly atrophied	Had liver cirrhosis; died at operation 1/30/43; estrogens reactivated ?
3. B. D. Age 65 White, Austrian-Jew. Married, 1 child. Date of admission, 4/13/42	Prophylactic, right	Local excision 15 years prior to axillary dissection, 2/23/42	2/23/42: infiltrating duct carcinoma, grade 3	Scar granulating; radical axillary dissection; no evidence of recurrence	Excision and axillary dissection elsewhere; irradiation postoperatively and orchiectomy	5/27/42: ? 12th D; 1-3-4 L 8/24/42: positive 12th D; 1-2-3 L	5/8/43	Atrophy, mild	Weight increase of 40 pounds; no pain; no evidence; bone regeneration by x-rays
4. A. I. Age 64 White, Irish-Catholic. Married, 1 child. Date of admission, 6/1/43. Meadowbrook Hospital	Primary operable, left	Breast lump, 3 weeks; bilateral hydrocele, 3 years	6/12/43: local excision: adenocarcinoma	Left breast lump 2 cm.; no nodes	Local excision only; axillary dissection; orchiectomy	Negative chest; no symptoms of bone metastasis	6/12/43	Testes normal	10 months after excision axilla was dissected; no metastasis
5. E. S. Age 39 White, Irish-Catholic. Married, 2 children. Date of admission, 10/15/43	Primary inoperable, right	Right breast lump 2×1.5 cm., 6 months; 8 lb. weight loss; axillary nodes, bilateral	10/18/43: aspiration biopsy; carcinoma	Lesion having skin attachment; many nodes; pain in back	Orchiectomy only	10/15/43: ribs 11/22/43: skull and pelvis 12/30/43: widespread 2/21/44: increase 3/20/44: increase	12/8/43	Testes essentially normal	Died of disease 4/4/44
6. A. P. Age 63 White, German-Catholic. Married, 2 children. Date of admission, 2/1/43	Primary inoperable, left	Left breast lump 7 months, 5×4 cm.; ulcer of nipple, slight; cutaneous nodules; mass in axilla 5×4 cm.	12/1/53: aspiration biopsy; carcinoma	Primary 5×4 and axillary mass 5×4; cutaneous nodules	Orchiectomy only	10/1/43: pulmonary, more evident on right 3/ 1/44: increase 3/31/44: decrease ? 5/24/44: pelvis positive; lung not so well defined	1/19/44	Atrophy slightly tubular; spermatogenesis noted; normal interstitial cells	Breast tumor somewhat smaller; no change in nodes; less pulmonary disease; no increase in pelvic metastases present on admission

SURGICAL CASTRATION

The 31 patients surgically castrated may be analyzed in the same way as those having radiation castration.

The first of 2 patients improved who were surgically castrated when uterine fibromyomas were removed had the operation and radium castration. The second had surgical castration less than a year after treatment of the cancer of the breast. The patient listed as possibly improved had surgical castration three years after treatment of an early carcinoma of the breast and therefore may have been well ten years later. It may be noted that none had improvement of bone metastases

except the one who also had ovarian metastases and is therefore listed under that heading.

The 7 patients considered to have possibly benefited by castration are all living and well at this time but were too recently castrated to have scientific significance.

THE STUDY ON ORCHIECTOMY FOR BREAST CARCINOMA

In 1942 Farrow and Woodard,[21] working in our Breast Department, were led to observe the effects of the administration of androgens and estrogens on the serum calcium in patients with skeletal metastases from breast cancer. Impressed by the favorable results obtained in the retardation of the growth of osseous metastases in mammary carcinoma by radiation castration, they studied the effects of "Chemical castration" by the injections of testosterone propionate. They found that the 3 patients who received such therapy had increased blood calcium levels as well as an increased output of calcium in the urine. The chemical changes were accompanied by clinical and roentgenographic evidence of increased activity in the metastatic disease in bone. They inferred that the ability of the male and female sex hormones to cause hypercalcemia in such cases was due to the stimulation by the hormones.

TABLE 5.—*Results in 31 Cases of Surgical Castration*

	Course of Disease			
Indication	Improved	Possible Improvement	Not Improved	Totals
Bone metastases	0	2	4	6
Primary castration	0	4	3	7
Ovarian metastases	2	0	6	8
Primary carcinoma or sarcoma of ovary	0	0	2	2
Fibromyomas of uterus	2	1	4	7
Recurrent carcinoma of breast	0	0	1	1
	4 (13%)	7	20	31

The use of androgens for such therapy, the numerous recent favorable results reported in treating inoperable and metastatic carcinoma produced by x-ray castration and the older reports on surgical castration for inoperable breast cancer in females suggested that a similar procedure be tried in males. Farrow and Adair[22] observed the results of orchiectomy on metastatic osseous metastases. Four months later the case was reported. At that time only the clinical effects could be interpreted. That case is now reported fully, together with 5 additional cases (table 4).

At the time at which orchiectomy was performed the clinical classification of these six cases was primary operable 1, recurrent inoperable 1, primary inoperable 3 and prophylactic 1.

The consent for orchiectomy, even in elderly men with advanced breast cancer, was most difficult to obtain. It appears to be a triumph of medical persuasion to obtain permission for this operation. Even 1 elderly man with intense pain from osseous metastases was unwilling to undergo castration.

The effects of orchiectomy may be illustrated by the following abstract on the first case history:

M. S., aged 72 when he was admitted to the Breast Clinic of Memorial Hospital on April 28, 1941, had a mass in his left breast which had ulcerated four months prior to his admission to the clinic.

The patient was fairly well preserved. The physical examination revealed a sloughing ulceration which had destroyed the left nipple and areola. There was a crater measuring 3 cm. in diameter, beneath which was a stony hard mass about 5 cm. in diameter. The tumor was fixed to the chest wall. There were several small axillary nodes.

It was difficult to obtain the patient's cooperation. He did not return for any treatment until February 1942. At this time the lesion was still movable over the chest wall but the ulceration had increased (fig. 1). In addition to the original findings, he had pain in the lumbar spine and pelvis. There were numerous areas of osteolytic bone destruction involving especially the ribs (fig. 2), fourth lumbar vertebrae, the pelvis and the upper femurs.

A formal incisional biopsy was obtained at the time of bilateral orchiectomy. The pathologic report was "infiltrating mammary carcinoma, grade 2." There was decided regression in the primary lesion, the ulceration having healed and the tumor regressing much in size. In March 1942 the lesion of the left breast appeared only as a scar (fig. 3). The patient experienced considerable relief from pain within two weeks after orchiectomy. There was regression in the osteolytic areas with metastases, and the pathologic fractures of the ribs noted in the initial film had healed (fig. 4).

Fig. 1.—Ulceration and destruction of the left nipple and areola by mammary carcinoma in a male breast.

The case represents a satisfactory and unusual regression for a two and a half year period of a primary cancer of the male breast which had widely metastasized to bone.

We may summarize the clinical results of this study by stating that bilateral orchiectomy is responsible for the regression of the primary lesion in 2 instances, quite strikingly in 1 of the cases. It has possibly prevented recurrence in the primary operable case treated

21. Farrow, J. H., and Woodard, H. Q.: Influence of Androgenic and Estrogenic Substances on Serum Calcium in Cases of Skeletal Metastases from Mammary Cancer, J. A. M. A. **118**: 339 (Jan. 31) 1942.
22. Farrow, J. H., and Adair, F. E.: Science **95**: 654, 1942.

only by local excision and may have prevented local recurrence in 1 other instance. The procedure has caused regression and repair in the secondary deposits in bone as well as in lung. The clinical regressions in this study compared with those reported for inoperable and metastatic carcinoma of the prostate have had the same dramatic cessation of metastatic bone pain as well as the spectacular immediate feeling of well-being. The clinical improvement has been most striking and as permanent. In fact, we think this procedure for male breast cancer at least parallels the results of orchiectomy for the advanced cases of prostatic cancer. One patient with advanced cancer has now survived two years and four months after castration, 1 thirteen months. Both are in excellent states of nutrition and are free from pain. Two have lived for nearly six months with

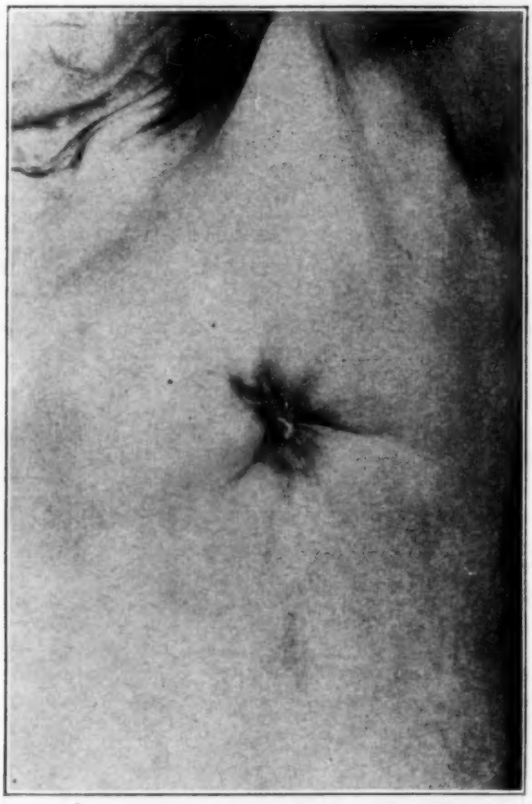

Fig. 3.—Resulting cicatrization of the primary mammary tumor two years and four months after orchiectomy.

regression of their disease, giving clinical promise of survival for equally long periods. Two of the patients have shown definite reparative changes in metastatic deposits in bone, while 1 with a solitary area of bone involvement has shown no evidence of progression of the disease, nor have other areas developed since castration. The latter patient has had regression in the extent of his pulmonary metastases. In 2 instances the primary lesions have greatly diminished. The patient with longest survival shows only a cicatrix of what was formerly a large ulcerating carcinoma; another patient shows regression in the ulceration and in the cutaneous nodules. The latter patient has not survived long enough to make it possible to evaluate the ultimate effect of orchiectomy on the breast tumor.

We must call attention to the relatively small number of male patients with mammary cancer available for such a study. However, the value of this type of therapy is most striking. The duration of the good effects yet remains to be determined. From our studies it would appear that the young men with breast cancer do not get the same spectacular improvement that the elderly men obtained from castration.

SUMMARY

It would appear that x-ray castration and surgical castration give improvements in approximately 13 to 15 per cent. In our studies there seems to be no appreciable difference in percentage of improvement between x-ray castration and surgical castration, although our series of surgical castrations is not sufficiently large to state this for a certainty. It would appear that castration in general has a temporary duration of improvement rather than a permanent one. It appears to retard the growth process materially for a duration, in cases which are improved, of about two years. It holds the cancer process in check but, in general, is not curative. The most striking effects in castration are those of male breast cancer, and here the work has been nothing less than spectacular. The change of the disease processes seems to be immediate in the cases of male castration, and the patients obtain the same striking improvement in general health as is shown in cases of carcinoma of the prostate which received castration.

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ABSTRACT OF DISCUSSION

Dr. Lawrence A. Pomeroy, Cleveland: My discussion of this paper will be based on the experience of Dr. E. P. McNamee and myself in the x-ray treatment of 73 patients with carcinoma of the breast. We follow the routine of the Tumor Clinic at Cleveland City Hospital in not treating the breast fields and axilla if the surgical removal has been adequate and if there is no microscopic evidence of involvement of the axillary lymph nodes. We have been surprised at the number of patients on whom a complete breast operation has been performed without any previous x-ray examination of the chest and of the bones most likely to be involved. Such an operation in the presence of metastasis is not justifiable and every effort should be made to exclude the presence of lung and bone metastases before operation. We have given ovarian irradiation irrespective of the age of the patient, the youngest being 33 and the oldest 83. We have done this because we have not known at what age to withhold the treatment and because ovarian irradiation adds only a few days to the usual postoperative x-ray series. We do not know whether to omit ovarian irradiation on patients who have ceased to menstruate or who have attained the age of 50 or 55 or of 60. We are not dermatologists. We are interested only indirectly in the dose that arrives on the skin. We are much interested in giving an accurate dose to the region of the ovaries. We have given at least 800 tissue roentgens to the region of the ovaries. The pelvic measurements (for x-ray therapy purposes) have varied from 15 to 24 cm. Taking the site of the ovaries as midway between the anterior and posterior pelvic walls, we have a depth dose of 57 per cent for the smallest pelvis and 38 per cent for the largest. The same x-ray dose to the skin delivers 50 per cent more to the ovaries in the small than in the large pelvis. This dose to the ovaries, expressed in tissue roentgens, should always be stated no matter what other factors of the x-ray dose are enumerated.

Dr. J. Shelton Horsley, Richmond, Va.: In the April 1944 issue of *Surgery* I reported a series of 25 cases in which bilateral oophorectomy with radical mammectomy was done for cancer in women in the premenopausal stage. These patients

have been traced. The last patient in this series was operated on Sept. 22, 1943; the first on Nov. 19, 1937. Two recurrences were reported. Since then there have been two other recurrences. As stated by Leo Loeb and others, mammary cancer after reaching a certain stage of development appears capable of growing under its own metabolism and is not dependent on estrogen. However, in the few cells sometimes left behind after a radical mammectomy and which may result in recurrence, it is probably necessary to have an estrogenic aid for them to grow. As emphasized by the authors, the relationship of the endocrines and their balance is not always constant. There have been cases in which erection and copulation have occurred after removal of the testicles. Likewise after removal of the ovaries a biologic product from the other endocrines, as the adrenals, may possibly substitute for the estrogen of the ovaries. Such cases, however, must be quite rare, and it would seem that removal of the estrogenic stimulation for the few isolated cancer cells left after a radical mammectomy would render them inert and would greatly increase the chances of cure. Probably many other surgeons have removed the ovaries in connection with a radical mammectomy, but I am unaware of any considerable number of cases in which this has been done and followed up for several years. Schinzinger of Germany had suggested this procedure in 1905 (Carcinoma of the Mammary Gland, *München. med. Wchnschr.* **52**:1724, 1905), but according to the records he does not seem to have performed the operation. X-ray treatment of the ovaries undoubtedly is helpful, but according to Huggins it does not destroy the interstitial cells in the testis and he advises orchiectomy for cancer of the prostate; so it would seem difficult permanently to destroy the functions of the ovary by irradiation without in some instances damaging the surrounding tissues. Some of these patients have exaggerated menopausal symptoms which might be relieved by estrogen products, but such treatment would, of course, be absolutely contraindicated.

DR. W. E. CHAMBERLAIN, Philadelphia: Patients with mammary cancer may and frequently do derive great benefit from having their ovaries irradiated. But who has definite answers to such questions as the following? "Is bilateral oophorectomy sometimes (or never, or always) superior to roentgen castration?" "Could it be that roentgen castration is better than oophorectomy because of some selective effect on the endocrines?" "Should roentgen castration (or oophorectomy) be used only in young women, or is there a possibility of benefit even in postmenopausal patients?" "When skeletal metastases from mammary cancer regress spectacularly after irradiation of the ovaries, why are the benefits so frequently short lived?" "Should the pituitary be irradiated in these cases? If so, when should that be done and what technical factors should be used?" Dr. Adair and his collaborators have contributed much toward the answers to such questions. A woman whose ovaries were removed at the age of 21 developed a particularly vicious and fast growing breast cancer at 48. Histologically it was undifferentiated in the highest degree. Axillary metastases were present when the breast tumor was first discovered. At radical mastectomy the gross findings, like the histopathology, pointed to early, rapid recurrence. But this woman had been receiving injections of estrogens (and latterly of diethylstilbestrol by mouth) for over twenty years. We discontinued this and now, more than a year later, she remains apparently well! Such a case enhances our interest in Dr. Horsley's proposal—routine prompt bilateral oophorectomy in premenopausal women with breast cancer. In the choice between oophorectomy and irradiation, consideration must be given to the fact that in a certain percentage of young women even very large amounts of radiation may fail to put an end to ovarian function. Jacox has given quantitative data on this point. In at least a dozen instances in young women I have seen skeletal metastases from breast cancer regress following ovarian irradiation, recur or progress after an interval of from three months to a year, and then regress a second time after a second ovarian irradiation. Would these women have been better off with surgical castration? I have not been able to find the answer to that question either in my own records or in the reports of others.

DR. NORMAN TREVES, New York: The use of estrogens to inhibit osseous metastases from mammary cancer is an unwarranted and dangerous procedure. It stimulates their growth. The use of androgens to check secondary bone deposits in breast carcinoma in women is an equally bad therapeutic measure. The patients do not do well on any type of endocrine therapy when malignant tumors of the breast have invaded bone. There is great difficulty in obtaining consent for castration in males; women consent to bilateral oophorectomy with less reluctance. The male feels that his sexual life is never over, while a woman approaching the climacteric usually realizes that there is a physiologic cessation of her reproductive functions. Consequently the number of male castrations is appreciably smaller. Dr. Adair did not have time to emphasize the finding that there were a number of cases in the present study in which the breast carcinoma had metastasized to the ovary. In the 6 cases in which the testes were examined after orchiectomy there was no evidence of metastases to the testes. It has frequently happened that carcinoma of the breast metastatic to the ovary may bring about pathologic castration. An Italian was the only patient on whom Farrow and Adair had made a preliminary report. He refused castration until the metastases to bone caused him so much pain that he then consented to the procedure. It is now twenty-eight months since orchiectomy was performed. He had widespread metastases to the pelvis, lumbar spine, scapula and humerus, and these showed definite regression following castration. The second patient, an elderly man with associated cirrhosis of the liver, had a radical mastectomy and then was treated after a recurrence in the scalp was noted seven months after removal of the breast. Then he was treated with estrogen and there was wide dissemination of his mammary disease. He finally consented to orchiectomy. His death, three days after operation, was probably due to the associated cirrhosis of the liver and not to the effects of the operation. The third patient, an elderly man with recurrence, had definite relief from bone symptoms following orchiectomy and he has now remained well sixteen months after operation. The fourth patient, an elderly man with a localized tumor in the left breast and associated bilateral hydrocele, had an excision of the tumor. In repairing the hydrocele the procedure was simplified by performing a bilateral orchiectomy. It is now a year after this procedure and he has had no metastatic nodes in the axilla. It is possible that this tumor, 2 cm. in diameter, might have been taken care of by the local excision and we shall know only by the follow-up whether local excision with associated orchiectomy will control mammary cancer in the male. The fifth patient had pulmonary and osseous metastases. He was castrated in December 1943, yet he has had regression in the pulmonary metastases, and one area of bone metastases in the right ilium has not progressed since his operation. The youngest patient in this group, aged 39, failed to respond to castration. His disease progressed rapidly and he died four months after orchiectomy. Why castration for cancer of the breast in elderly males seems to be a much more satisfactory procedure than in young men cannot be explained at the present time and merits further studies.

Medical Institutions in Thailand.—The most important medical institution in Thailand was the medical department of the Chulalankarana University. The medical department, which had existed as a school since 1889, became a part of the aforementioned university in 1923, at which time a four year course was inaugurated. Two years of collegiate work were required before the candidate could begin the four year medical course. In 1929 the first class of 19 students was graduated. Both men and women were admitted, and 166 persons had been graduated with the degree of doctor of medicine by 1937. The medical department, at the time of the last report, had 44 instructors and professors and a library of 3,600 volumes.—Simmons, James S.: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

THE INADEQUACY OF A STANDARDIZED DOSAGE OF PENICILLIN

IN THE TREATMENT OF GONOCOCCIC URETHRITIS

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Reports of the efficacy of penicillin in the treatment of gonococcic urethritis have appeared. Previous studies [1] of clinical trials with this type of therapy have demonstrated its curative value. Later reports [2] on the rapidity of its therapeutic effect on gonococcic urethritis have further suggested that it approaches a 100 per cent clinical and bacteriologic cure. Reported failures with penicillin therapy are very rare.

The literature, to date, contains no report of a study which actually reveals the rapidity of bacteriologic cure based on serial cultures following each dose of penicillin. This study was set up to determine the exact point of bacteriologic cure within the limits of the units of penicillin used.

It has been our experience after culture study of several thousand cases of gonorrhea that clinical cure is not a definite indication of bacteriologic cure. Except in frank cases of gonococcic urethritis, smears are not a very reliable means of establishing diagnoses. Determination of bacteriologic cure necessarily varies with the ability to culture the gonococcus organism. It has been clearly demonstrated that cultures are far more reliable than smears as diagnostic aids and that some cultural methods are far superior to others.

For some time it had been noted that a good number of patients with gonococcic urethritis were being readmitted to our naval hospital and center dispensaries after having received 100,000 units of penicillin. Every one of these individuals had been previously discharged as clinically and bacteriologically cured. None of these cases were reinfections, since all of them had been under restriction for twenty-one days following penicillin therapy without possible reexposure. All had reported back within this twenty-one day period. Since this observation was at variance with another report [3] indicating that the total amount of penicillin required did not exceed 100,000 units and that all cases responded to penicillin and were cured from a clinical and bacteriologic standpoint within forty-eight hours, a preliminary attempt was made to test these observations. In 73 cases cultures were taken on a whole blood hemolyzed blood plasma agar medium.[4] In all of these cases 100,000 units of penicillin had been injected intramuscularly in doses of 20,000 units every three hours. A culture was taken in each case two days after therapy, seven days later and fifteen days later. Our experience in this preliminary study revealed that there were 13 (17.8 per cent) bacteriologic failures at varying periods of time following therapy. Accordingly, a carefully controlled series of cases were placed under study to verify these preliminary observations.

METHODS

One hundred and thirteen patients with gonococcic urethritis who were either sulfonamide sensitive or harbored sulfonamide resistant strains of the gonococcus were treated with penicillin in doses of 20,000 units given intramuscularly every three hours until each patient had received a complete dosage of 100,000 units. On being admitted to the ward and before penicillin therapy was initiated, a prostatic culture was taken on each patient to verify the diagnosis. Urethral cultures were taken in each case three hours following the initial dose and before each succeeding dose of 20,000 units. A prostatic culture was taken on each patient three hours following the injection of the fifth or final dose of penicillin. If the final prostatic culture was negative and the patient appeared to be clinically cured, the patient was discharged to duty. Each discharged patient received a slip permitting him only light duty for a period of ten days. In addition, each patient was recalled for prostatic cultures on three successive weeks but on varying days. Since each patient was under restriction

TABLE 1.—*Summary of Statistical Analysis of Penicillin Therapy in 113 Cases of Gonococcic Urethritis* *

Units of Penicillin Required for Cure	White Males			Negro Males			Total		
	No.	%	Cumulative %	No.	%	Cumulative %	No.	%	Cumulative %
20,000	6	8.24	8.24	4	10.00	10.00	10	8.85	8.85
40,000	17	23.25	31.49	13	32.50	42.50	30	26.60	35.45
60,000	14	19.18	50.67	5	12.50	55.00	19	16.80	52.25
80,000	7	9.59	60.26	2	5.00	60.00	9	7.96	60.21
100,000	5	6.85	67.11	6	15.00	75.00	11	9.74	69.93
120,000	6	8.24	75.35	4	10.00	85.00	10	8.85	78.80
140,000	0	....	75.35	2	5.00	90.00	2	1.77	80.57
160,000	4	5.49	80.84	0	....	90.00	4	3.54	84.11
180,000	4	5.49	86.33	0	....	90.00	4	3.54	87.65
200,000	1	1.37	87.70	1	2.50	92.50	2	1.77	89.42
220,000	5	6.85	94.55	0	....	92.50	5	4.44	93.86
240,000	0	....	94.55	0	....	92.50	0	....	93.86
260,000	2	2.74	97.29	2	5.00	97.50	4	3.54	97.40
280,000	0	....	97.29	0	....	97.50	0	....	97.40
300,000	0	....	97.29	0	....	97.50	0	....	97.40
320,000	1	1.37	98.56	0	....	97.50	1	0.88	98.28
340,000	0	....	98.56	0	....	97.50	0	....	98.28
360,000	0	....	98.56	1	2.50	100.00	1	0.88	99.16
380,000	0	....	98.56	0	....	.....	0	....	99.16
400,000	0	....	98.56	0	....	.....	0	....	99.16
420,000	0	....	98.56	0	....	.....	0	....	99.16
440,000	0	....	98.56	0	....	.....	0	....	99.16
460,000	1	1.37	100.00	0	....	.....	1	0.88	100.00

* Amount of sulfonamide administered before penicillin therapy instituted = range 135 to 5,300 grains (8.75 to 325 Gm.).

TABLE 2.—*Effect of 100,000 Units of Penicillin on 106 Patients in Outlying Dispensaries* *

	Number	Per Cent
Cured with 100,000 units	70	66.1
Not cured with 100,000 units	36	33.9

* Amount of sulfonamide administered before penicillin therapy = range 33 to 3,561 grains (2.15 to 230 Gm.).

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3. Miller, C. P.; Scott, W. W., and Meller, V.: Studies on the Action of Penicillin, J. A. M. A. **125**: 607-610 (July) 1944.

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for twenty-one days, without possibility of reexposure, a constant supervision of each case was possible. If a patient had a positive bacteriologic culture, the same procedure of therapy and serial cultures was followed until each patient was judged bacteriologically cured after having three negative prostatic cultures over a

TABLE 3.—*Day of Appearance of Positive Culture Following Penicillin Therapy in Varying Dosages Greater Than 100,000 Units* *

Day	Number	Per Cent
1	..	.....
2	10	20.00
3	5	10.00
4	5	10.00
5	2	4.00
6	1	2.00
7	2	4.00
8	1	2.00
9	4	8.00
10	2	4.00
11	1	2.00
12	5	10.00
13	0	0.00
14	1	2.00
15	2	4.00
16	5	10.00
17	0	0.00
18	3	6.00
19	1	2.00

* Range two to nineteen days.

period of twenty-one days following the last dose of penicillin. All of these persons were treated in a single ward and were directly under our supervision.

Penicillin was also being administered for cases of gonococcic urethritis in several dispensaries in the Naval Center. Arrangements were made to take cultures of 106 cases following therapy of 100,000 units of penicillin administered in the same way but without serial cultures. Prostatic cultures were taken on each patient during the period of their twenty-one day restriction. Three negative cultures over a period of twenty-one days were required before these patients were considered bacteriologically cured. If the patient yielded a positive prostatic culture, he was returned to a dispensary for additional therapy. These positive cases

TABLE 4.—*Day of Appearance of Positive Culture Following Penicillin Therapy of 100,000 Units in 106 Patients in Outlying Dispensaries* *

Day	Number	Per Cent
1	2	5.56
2	4	11.12
3	3	8.34
4	1	2.78
5	3	8.34
6	1	2.78
7	1	2.78
8	0	0.00
9	6	16.67
10	0	0.00
11	2	5.56
12	2	5.56
13	0	0.00
14	3	8.34
15	2	5.56
16	5	13.83
17	0	0.00
18	1	2.78

* Range one to eighteen days.

were then dropped from this study. This group of 106 cases was followed in order to check the findings on the experimental groups of 113 cases. All cultures were done under the supervision of one of us. The swab used in taking the cultures was fashioned from an applicator with one end tapered and bound with a small amount of tightly adherent absorbent cotton. The use of this type of swab is of paramount importance in taking cultures in a male patient. The penis was first thoroughly cleansed with tincture of green soap and water followed by 70 per cent alcohol. All prostatic and urethral cultures were taken by inserting a sterile swab for a distance of 2 centimeters into the anterior urethra and then rotated to collect the expressed fluid. The culture material was streaked on the whole blood hemolyzed human blood plasma agar medium, which has proved so very effective in growing the gonococcus. The swab was carefully rotated, so that all parts of its surface came in contact with the culture medium. All cultures were incubated in candle jars for forty hours and the colonies were then examined macroscopically and by the oxidase method. Smears and Gram stains were made of all oxidase positive colonies. No cases were considered positive unless the oxidase reaction was typical and typical staining and morphology were demonstrated microscopically.

In this study no attempt is made to determine the value of continued uninterrupted therapy with units of penicillin in excess of total doses of 100,000 units.

Fig. 1.—Culture plate of a typical case of gonococcic urethritis before penicillin therapy is instituted.

This investigation was set up to test the efficacy of the 100,000 units total dosage of penicillin which had been reported in previous studies.

OBSERVATIONS AND RESULTS

The results of the experimental study in the serial culturing of the 113 patients with gonococcic urethritis are shown in tables 1 and 3. These results reveal that, contrary to some reports of previous experimental studies, the dosage of 100,000 units of penicillin will not insure a 100 per cent bacteriologic cure. These figures reveal that only 70 per cent of the patients were bacteriologically cured with 100,000 units, 89 per cent with 200,000 units and 97 per cent with 300,000 units. One case required 460,000 units. No bacteriologic failures were observed after use of adequate doses of penicillin.

In the three month period during which this study was carried on, there was not a single readmission from this experimental group for gonococcic urethritis following the three negative cultures over a period of twenty-one days.

These results clearly demonstrate that it is possible to get bacteriologic positive cultures from two to nineteen days after penicillin therapy given in 20,000 unit intramuscular doses every three hours in blocks of a total of 100,000 units. Of the cases requiring more than 100,000 units, 26.5 per cent yielded positive cultures after fifteen days following therapy.

An analysis was made to determine any variation in the effect of penicillin in Negro and white patients. This analysis revealed that 67.2 per cent of the white males and 75 per cent of the Negro males were cured with the 100,000 units dosage.

The results of the study with the 106 cases in the outlying dispensaries are shown in tables 2 and 4.

These results substantiate the experimental study. Only 67 per cent of the cases were cured with 100,000 units of penicillin. Of the cases requiring more than 100,000 units, 17 per cent turned up positive after fifteen days following therapy.

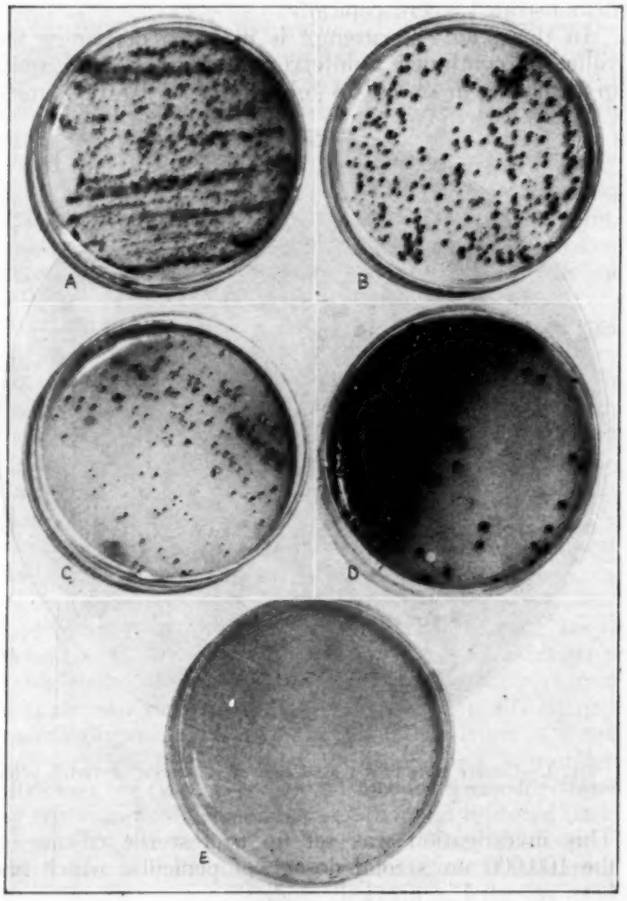

Fig. 2.—Effect of penicillin revealed by serial cultures on a patient with gonococcic urethritis: *A*, after 20,000 units; *B*, after 40,000 units; *C*, after 60,000 units; *D*, after 80,000 units; *E*, after 100,000 units of penicillin.

Figure 1 is a culture plate of a typical case of gonococcic urethritis before penicillin therapy is instituted.

Figure 2 shows the effect of penicillin in serial cultures after 20,000 units, 40,000 units, 60,000 units, 80,000 units and 100,000 units respectively, in the 70 per cent of the cases that responded to the 100,000 units dose. These photographs are taken from a single case but are typical of the group. It is interesting to note the decrease of the number of colonies in successive cultures with penicillin therapy and the increase in the size of the colonies as they are reduced in numbers.

CONCLUSIONS AND RECOMMENDATIONS

As a result of these observations, the following conclusions were drawn and recommendations made:

1. Clinical cure is not necessarily an indication of bacteriologic cure in patients with gonococcic urethritis.
2. Seventy per cent of the cases of gonococcic urethritis were cured with a dosage of 100,000 units of penicillin.
3. Doses of 200,000 or 300,000 units of penicillin given in 20,000 unit doses intramuscularly every three hours seems to be a more adequate dosage, since 89 per cent and 97 per cent of the cases were cured, respectively, with these doses.
4. Positive cultures for the gonococcus may appear from two to nineteen days following inadequate therapy with penicillin.
5. Patients with gonococcic urethritis should have prostatic cultures at weekly intervals for at least three weeks following penicillin therapy.
6. Three negative cultures taken at weekly intervals following penicillin therapy seem to be an adequate indication of bacteriologic cure.
7. Diagnoses by cultural methods are far more reliable than those obtained from smears.
8. Determination of bacteriologic cure is dependent on adequate culture methods and interpretations by a trained bacteriologist.

INTER-AMERICAN COOPERATION IN MEDICINE

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The growing power of inter-American cooperation is manifest not only in the waging of war against the Axis nations but also in the marshaling of forces for scientific and economic progress in this hemisphere. Now as never before the people of the Americas are working together for advancement of the common good through preventing disease, prolonging life and promoting health and efficiency, with concomitant development of commercial relations.

In the tropical countries health measures have special significance as a basis for economic progress, as experience has amply demonstrated. The provision of maximum health, with its attendant benefits, must in the final analysis be guided by local men trained in local medical schools and hospitals. The support and strengthening of national institutions is of primary importance in the practice of inter-American cooperation in medicine.

In the past the southern countries were linked more closely with Europe than with the United States. The medical men of the other Americas, who for four centuries were intimately connected with European medical science, have only within the last twenty years been increasingly associated with medical science in this country.

Too little is known in the United States of the past and present achievements of the other Americas in the medical field. The world is greatly indebted to such pioneers as Leon y Blanco, who by self experimentation supplied final proof of the spirochetal etiology of pinta, and Carrion, who similarly demonstrated the unity of Oroya fever and verruga peruana. We must

pay tribute to the skill of such Brazilians as the master clinician Miguel Conto, the sanitarian Oswaldo Cruz and his brilliant pupil Carlos Chagas. In the field of tropical medicine no peer could be found for many of the experienced practitioners whose power of observation and acumen have been sharpened by the complex clinical pictures of superimposed conditions.

While it is true that the medical problems of the southern republics are characterized by a greater prevalence of the tropical infections than occur in this country, the diseases that are common to the hemisphere are many and important. Tuberculosis, diseases of the heart, cancer, pneumonia and other respiratory ailments are widespread. Infant and maternal mortality are of general concern. The study and practice of medicine offer unanimity of interest.

It would be greatly to our advantage to be better informed concerning the outstanding contributions of the world famous institutions for scientific research established in practically every southern country. These are too numerous to list, but the National Bacteriological Institute and the Institute of Physiology of Buenos Aires, the Oswaldo Cruz Institute, near Rio de Janeiro, the Institute of Bacteriology in Santiago, the new Institute of Tropical Medicine in Mexico and the National Institute of Hygiene and Public Health in Lima may serve to illustrate their diversity. There are many others where brilliant work is being done.

The first hospital in the Western Hemisphere was probably that in Santo Domingo in 1503, and since that time hospitals in many of the republics have made medical history. Today fine hospitals exist in the larger cities throughout the other Americas. Eleven Latin American countries have adopted social security systems of varying scope and coverage. This has had a definite influence on hospital development as well as on the status of medicine in some of the countries.

Medical courses were organized early in the history of the colonies, and by the seventeenth century medicine was being taught in at least eight of these countries. After the wars of independence many of the medical schools were reorganized, and it was at this time that medical connections with the United States were first strengthened.

Medical education and to a great extent medical practice in Latin America have been developed largely under European influence. The French and German influence has perhaps been most important and long lasting, although that of Spain, Great Britain, Italy and Portugal also played a part. The continuing choice of Europe for foreign study was frequently motivated by expense as well as by cultural ties. Not only have physicians gone abroad to study in these countries, but also medical curriculums, terminology, textbooks, professors, procedure and medicines were imported. In accordance with the European tradition, emphasis is placed on clinical medicine and brilliant clinicians have developed. The laboratory aspects tend to be considered as accessories to clinical medicine rather than an integral part of it. There is a great need for up to date low priced textbooks and journals, such as THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. Microscopes and other laboratory equipment are often inadequate.

Admission to medical schools is usually dependent on completion of a three or four year high school course or its equivalent. The medical training generally requires from five to seven years of work with varying requirements as to internship and externship. The Mexican government is attempting to introduce a combination education and sanitation program into rural Mexico. Three thousand medical students have been enrolled in the University of Mexico alone, besides great numbers in other medical schools of the country. These students are subsidized. After graduation as part payment for government support they must spend a specified time in field work in the rural districts, a program that might well be applied with great benefit in many of the rural areas of the United States. This is a significant experiment in the orientation of medical education to the need of the people, with an attempt to improve distribution of services for the prevention as well as the treatment of disease throughout the population.

The practice as well as the study of medicine in the other Americas is greatly hampered by lack of funds. There is an insufficient number of hospitals and beds, a great deficiency of nurses and a paucity of trained hospital administrators. Equipment is frequently inadequate. However, real progress is being made in the hospital field, and hospital construction projects are under way in many countries.

The number of students coming to this country either for medical or for postgraduate training is on the increase, and American trained doctors are now fairly numerous. Understanding and collaboration in medical fields has been promoted by the work of the Pan American Sanitary Bureau and through the United States Army, Navy and Public Health Service, the Rockefeller, Kellogg, Markle and other foundations and the Institute of Inter-American Affairs. Medical Pan Americanism has thus been served through actual health work in the other Americas, the improvement of medical and nursing schools and grants of fellowships in the United States.

The mutual benefits of exchange of ideas and personnel must be stressed, for, as has been noted, the differences of language and cultural ties have acted as barriers against more complete knowledge and appreciation of the scientific achievements of these neighbor countries. A desirable communion has been fostered by a series of Pan American medical and sanitary congresses held over a period of fifty years. The American Medical and Public Health Associations and the American Society of Tropical Medicine have long encouraged participation of representatives from the other Americas at their meetings. A most encouraging development is the organization in 1941 of the Inter-American Hospital Association. Institutes for hospital administrators have been held with great success in Puerto Rico, Mexico City and Lima, Peru.

The Institute of Inter-American Affairs through its Health and Sanitation and Training Divisions is industriously promoting inter-American cooperation in medicine and public health. The institute is a governmental corporation, organized and controlled by the Office of Inter-American Affairs. The general purpose of the institute is to aid and improve the health and general welfare and to promote the economic security of the people of the Western Hemisphere.

The need for mutual collaboration between the peoples of the American republics was fully recognized at the conference of the ministers of foreign affairs of the American republics held at Rio de Janeiro, Brazil, in January 1942. The members of that conference in the light of their full knowledge of the great war and of the enormous problems that would face their countries in the postwar period resolved that every effort should be made to achieve close cooperation and collaboration

between the American republics to the end that there might be a steady and continuing improvement in health and welfare throughout the Western Hemisphere.

The resolution was not taken solely out of a spirit of pure humanitarianism. The constant aim of all the enlightened leaders of the nations of the Western Hemisphere is to achieve economic development and prosperity for the peoples of their respective countries. It was realized that, in order to bring about that effect, greater weight must be given to medicine and public health and close attention must be focused on them, not only in the sense of controlling epidemic diseases, but also from the aspect of bringing about conditions appropriate to the development of healthy people able to cope with the economic problems of reconstruction —the bitter problems which will emerge to plague and harass all of us during the peaceful years when we are rebuilding in the ashes of this devastating war. It was recognized that there must be uniformity of procedures and practices throughout the hemisphere. It was foreseen that all the American republics must work together and apply in close collaboration and harmony tested health measures for the mutual benefit of all.

It must be emphasized that progress in health is international and hemispheric in scope. By its nature it cannot today be merely national. It follows that improvement of health services will be of distinct benefit to the United States of America and to all of the other American republics because it will be a factor in the economic development and prosperity of each country and thus, in turn, to the prosperity of the rest of the hemisphere.

The Institute of Inter-American Affairs has three divisions, namely the Health and Sanitation, Food Supply and Training divisions. The activities of the first two divisions are financed by appropriations from the United States and the governments of each of the eighteen republics now participating and through cooperative agreements with representatives of each government. The work is carried on through an intermediary organization composed of United States and national personnel and serving as an integral part of the national departments of health.

The training program is financed by the institute. Through the health and sanitation grants 165 students have completed their work and 145 are now in training. The total of 310 includes 172 trainees in public health, 73 in sanitary engineering and 65 in the medical sciences. These include a number of men who are returning to teach in the medical schools.

In a recent report from one of the trainees, the comment is made that the prestige of United States medical science is apt to be ascribed to the lack of material difficulties in accomplishment of work. Familiarity with North American hospitals discloses other factors responsible for the degree of success attained by medicine in this country, notably the fact that the American doctor is a tireless worker and is possessed of a high degree of scientific honesty and spirit of collaboration. This visitor sees medicine here as a series of teams that function with clocklike precision.

Such observations indicate that training programs not only are directly beneficial in promoting Latin American medicine and public health but also are believed to be providing one of the strongest links in the union of the Americas. Collaboration among medical men of the Americas is being furthered not only by the provision of fellowships but also in the actual execution of the cooperative health work in the southern countries.

The provision of medical and public health services for persons directly engaged in the war effort is an important function of the Cooperative Health Services. The control of malaria has received major emphasis. General activities include such features as physical examinations, vaccination, emergency medical care, the distribution of medicines and the provision and supervision of elementary sanitation. In this fashion an attempt has been made to improve the health and efficiency of the workers in rubber areas, on cinchona and sisal plantations, in the tin mines and in the rich, diversified mining regions of Brazil, as well as of highway and railroad workers in several of the countries. Sanitation and other public health measures have been intensified around air bases and in areas where our armed forces are stationed.

In addition to this work, which is largely of emergency and temporary character, the Cooperative Health Services are planned to supplement and extend existing activities and to introduce new patterns in the provision of a sound plan for immediate and long-term disease control. In accordance with the prescribed directives for the extension of public health, the campaign includes increased opportunity for the utilization of therapeutic and preventive measures through the construction, equipping and operation of hospitals, dispensaries, clinics and health centers; fundamental and widespread activities for improved water supply systems, for sewage disposal, insect abatement, and other sanitary measures; training of professional workers in their specialties and education of lay groups for the provision and practice of healthful living; and direction and evaluation of control measures through field and laboratory investigation.

The physicians of this hemisphere are sharing ideas and experience in the hospitals and health centers of Latin America and on the cooperative projects for the control of typhus fever in Colombia, El Salvador, Guatemala and Mexico, of schistosomiasis in Venezuela, and of diphtheria and typhoid in Uruguay. They are collaborating in the advancement of scientific knowledge through such studies as the use of penicillin in the treatment of yaws, experimental work in the treatment of filariasis, and investigations of onchocerciasis and tropical ulcer. Financial assistance has been given in support of the work of the Pan American Sanitary Bureau in numerous projects such as the provision of fellowships in military medicine for doctors from the medical corps of the other American republics, aid to the Inter-American Hospital Association, venereal disease control along the United States-Mexican border, medical and public health experts invited to attend conferences or visit institutions in the United States and the collection of biostatistical and epidemiologic information.

Latin American medicine is being strengthened by the building and equipping of facilities such as hospitals, clinics and dispensaries. A total of thirty-four hospitals has already been constructed or remodeled. Additional laboratories are also providing more adequate diagnostic facilities in many areas. Programs for establishment of nursing schools and training of nurses as well as short courses for hospital and visiting aides and laboratory technicians are providing essential subsidiary personnel. Consultants sent by the Institute of Inter-American Affairs have visited a number of the countries in connection with hospital planning, medical

school surveys and other phases of medical and public health work.

Medical science throughout the Americas is today profiting from a reciprocity that has been greatly accelerated in recent years. The advantages of this hemispheric teamwork are evident not only in the promotion of health, with its attendant benefits, but also in mutual understanding and respect.

The Inter-American Cooperative Health Program is demonstrating in a realistic manner that the nations of the Western Hemisphere can work together, that such cooperation is feasible and that it is profitable for all the peoples concerned.

The list of materials Latin America supplies North American industry is long. It includes copper, lead, zinc, tungsten, tin, mercury and other industrial metals. It includes sisal, henequen and abaca, balsa wood and mahogany, vegetable oils, nitrate, wool, hides and skins. It also includes the increasing production of rubber, quinine and rotenone producing plants. In return the other American republics buy great quantities of manufactured products from the United States. The purchase from this country of drugs alone has soared to hitherto unequaled figures during the war years.

Together with food supply and transportation, health is essential for the realization of the promise of the Americas.

A solid foundation has been laid by the work of many individuals and organizations throughout the hemisphere. Current activities provide a strong framework for the structure of international collaboration of the future.

INTRAVENOUS HISTAMINE IN THE TREATMENT OF MIGRAINE

PRELIMINARY OBSERVATIONS

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One of the theories regarding the mechanism of migraine comes from observations made by Sir Thomas Lewis in 1926.[1] He showed that there is a threefold reaction to local skin irritation: (1) local reaction at the site of the irritant, (2) local release of histamine at the site causing a wheal immediately around it and (3) a further release of free histamine into the circulating blood. It is well known that the intradermal injection of histamine in certain individuals will cause this second phenomenon of wheal formation, which is essentially a vasodilatation. It is generally believed that the phenomenon of migraine is precipitated by the release of histamine into the blood stream as the result of an allergic reaction and that the major attack of migraine develops only in those individuals whose tolerance to histamine is low and who would be hyperreactors at one phase of the syndrome to the intradermal injection of histamine. This is the third phenomenon described by Lewis as the response to local irritation.

Early in 1940 Horton and Sheldon[2] discussed the mechanism of Ménière's syndrome, believing it to be a local vasodilatation in the inner ear, and successfully treated a number of cases by subcutaneous and later intravenous histamine injections.

It should be clearly understood that these clinical phenomena are not due to allergy to histamine in the commonly accepted sense of the word but rather to a lowered tolerance of the organism to histamine present in the circulating blood as the result of an allergic stimulation. Histamine is present in all cells but in only minute quantities in the blood; it is only the individual with lowered tolerance to histamine who thus responds to its release into the circulation, whatever the mechanism of that release may be. The release of histamine into the circulation regardless of its cause is only momentary, since it is immediately taken up by the cells, where vasodilatation then occurs. Because of this very brief period when histamine is present in the circulating blood it seemed reasonable to us to assume that the tolerance of an individual would be raised more effectively by the long continued injection of histamine than by individual doses of increasing strength.

Our interest in the problem of the treatment of migraine with intravenous injections of histamine arose from two articles which appeared at almost the same time in 1943. Miles Atkinson[3] in May discussed the similarity of migraine and Ménière's syndrome, their relation to allergy and histamine production. In July Rainey[4] described a number of cases of Ménière's syndrome previously unsuccessfully treated by subcutaneous injection of histamine but which were greatly benefited by prolonged administration of intravenous histamine. With these two papers in mind it seemed to us that there might be therapeutic value in applying this technic to the treatment of migraine.

The criteria used to determine whether a headache was migraine or not are as follows:

The headaches are paroxysmal and unilateral, usually postorbital. They are frequently preceded by auras or prodromes which involve many of the cranial nerves, especially vision, hearing, taste, smell and various cutaneous sensations, as well as frequent disturbances of equilibrium. The history often shows a familial tendency and there is frequently evidence of allergy, especially to certain foods such as chocolate. The attacks usually involve nausea and vomiting, and characteristic of migraine is a freedom from any symptoms between attacks. Migraine equivalents frequently alternate with more typical attacks, especially in the case of paroxysmal tachycardia.

TREATMENT

We have used no patients in this series who could conceivably have headaches from any other cause such as sinusitis, neuralgia of the face or scalp, hypertension, skull injury, eye strain or brain tumor. Thirty-four patients with severe or moderately severe "pure" migraine remain who have been treated by the intravenous injection of 1 mg. of histamine as 2.75 mg. of histamine acid phosphate. This is diluted in 500 cc. of isotonic solution of sodium chloride and injected very slowly, the speed of injection usually starting at about

From the Presbyterian Hospital.

Read before the Chicago Society of Internal Medicine.

1. Lewis, Thomas: The Blood Vessels of the Human Skin, Brit. M. J. **2**: 11, 1926.

2. Sheldon, C. H., and Horton, B. T.: Treatment of Ménière's Disease with Histamine Administered Intravenously, Proc. Staff Meet., Mayo Clin. **15**: 17 (Jan. 10) 1940. Horton, B. T.: The Use of Histamine in the Treatment of Certain Specific Types of Headaches, J. A. M. A. **116**: 377 (Feb. 1) 1941; The Use of Histamine in Ménière's Disease, Surg., Gynec. & Obst. **72**: 417 (Feb.) 1941.

3. Atkinson, Miles: Ménière's Syndrome and Migraine: Observations on a Common Causal Relationship, Ann. Int. Med. **18**: 797 (May) 1943.

4. Rainey, J. J.: Histamine in the Treatment of Ménière's Syndrome, J. A. M. A. **122**: 850 (July 24) 1943.

five drops per minute, the rate being increased as rapidly as is tolerated by the patient. Too rapid an injection will result in first a flushing of the face, often tachycardia and finally a typical severe headache which may be relieved by slowing the rate of injection or administration of epinephrine or ascorbic acid. The entire injection usually takes from four to eight hours. The blood pressure is taken hourly and any decided drop is considered an indication for cessation of treatment. Gastric analysis has been done in half our cases and has shown a high degree of secretion with very high acid values. The patients often complain of heartburn during histamine administration, but it is promptly relieved by mild alkaline powders. The onset of urticaria or asthma during the treatment is an indication for slowing the rate of injections or giving ascorbic acid. Patients have been given from three to four treatments with a day of rest after each one.

Certain precautions must necessarily be taken in the long continued use of a drug having such effects on the circulation and acid gastric secretion. No cases were used in which hypertension or cardiac or renal impairment was found to exist or in which there was evidence of mental or central nervous system disease. No patients with a history of peptic ulcer were given intravenous therapy, although 1 developed a duodenal ulcer twelve weeks after treatment.

Thirty-four patients with "pure migraine" were selected having an average age of 43 (table 1). The average age of onset of headaches was 18 and attacks had lasted from six to forty-eight years, an average of twenty-five. Not including 3 cases of status migrainicus the headaches lasted about nineteen hours and occurred twice a month.

No patients were used whose attacks were mild enough not to interfere with their regular life. The remaining ones were divided into moderately severe and very severe, the latter group (23) including only those who were incapacitated for more than eighteen hours or whose headache was so severe as to require opiates for relief.

We have found three different types of response as far as relief was concerned: (1) those whose relief was immediate, complete and apparently permanent, (2) those whose relief was immediate and complete but whose headaches recurred, usually in milder form, after weeks or months, and which were subsequently relieved by subcutaneous injections of histamine, (3) those who were not given immediate relief after the intravenous histamine but were relieved by one or more later subcutaneous injections and (4) those who obtained no relief.

TABLE 1.—*Summary of Cases*

Number of cases	34
Average age (32 to 63)	43 years
Age at onset (8 to 39)	18 years
Years symptoms present (6 to 48)	25 years
Duration of attacks *	19 hours
Frequency of attacks *	17 days

* Not including 3 cases of status migrainicus.

RESULTS

In a study of this group symptomatic relief from headaches as described by the patient was the only criterion which could be used; but this seemed of value in view of an average duration of twenty-five years of severe headache occurring every fortnight (table 2). Only 3 patients experienced no relief. Seven were improved either in severity of headaches or in decreased frequency or duration. Twenty-four were free from symptoms when last seen. All patients have been observed for at least six months since intravenous histamine therapy, 17 from twelve to eighteen months and 8 for more than eighteen months.

TABLE 2.—*Results*

Severity	Total Cases	Unimproved	Improved	Symptom Free
Moderately severe	11	2	2	7
Very severe	23	1	5	17
Totals	34	3	7	24

REPORT OF CASES

Four cases have been selected as characteristic: the first is one of great severity with complete relief most typical of our series; the second of very great severity having unusual features and with eventual relief; the third a case of moderate severity, complete relief, but with later development of a duodenal ulcer, and the last a case of great severity in which no relief was obtained.

CASE 1.—*Very severe headaches; complete relief from intravenous histamine.*

Mrs. H., aged 32, stated that the headaches began at 17, the menarche at 13. Her mother, father and twin sister had headaches. Three brothers had none. Since onset at 17 the headaches occurred only at menstrual periods until she was 23; on admission they occurred two or three times weekly, lasting from twelve hours to two days. They were unilateral and occipital, accompanied by photophobia, nausea and constant retching. During a headache her speech was indistinct. Morphine injections would often give no relief. She had had no headache during her two pregnancies. She was given three intravenous injections of histamine, having mild headache and heartburn during the first; for the latter she received 100 cc. of milk every half hour with relief. She has had no return of headache for fourteen months.

CASE 2.—*Very severe headaches; temporary relief from intravenous histamine; relief from further subcutaneous histamine.*

Mrs. P., aged 63, stated that the headaches began at 15, the menarche at 14. Her mother had headaches of such severity with "triple vision" that she committed suicide; one sister had headaches so severe that she developed melancholia. There were no living children. The headaches had been present for forty-eight years except during her two pregnancies. They are temporal and occipital, always unilateral. The headache was preceded by an aura of dimness of vision, when "everything was blurred and darkened but with spots of light like fireworks." The aura lasted thirty minutes and the headache began lasting one to six days; during this period she had double vision. The attacks occurred once to twice weekly and had been present so much of the time that she had been examined repeatedly for eye or brain disease. There was no relief from any medication, including morphine. Chocolate caused a skin rash and diarrhea. Examinations of the retinal and visual fields were normal. Four intravenous injections of histamine were given, the first preceded by 500 mg. of ascorbic acid intravenously in order to relieve the existing headache. One hour after beginning the second injection flushing of the face and neck occurred, relieved by intravenous ascorbic acid in the other arm. During each of the last two intravenous injections 500 mg. of ascorbic acid was added to the histamine salt solution. She was free from any

headache or visual disturbance for six weeks but then had two mild attacks two weeks apart, lasting about three hours each. She was then given subcutaneous injections of histamine weekly for six weeks without recurrence for seven months.

CASE 3.—*Moderately severe headaches, relief; later a duodenal ulcer developed.*

G., a man age 40, married, stated that the headaches began at 17. His mother and his mother's mother had sick headaches. There were no siblings. The headaches occurred every three to fifteen days, averaging once a week. They were temporal, occipital and always unilateral. They were associated with blindness, nausea and often vomiting. He also had urticaria from eating eggs and would always get a headache from chocolate. The headache lasted typically about twelve hours. Gastric analysis with an Ewald meal revealed free acid 40, total acid 65. Three intravenous injections of histamine were given. The patient developed urticaria during the first two injections, which was relieved by slowing the rate of the first injection and by intravenous ascorbic acid (500 mg.) during the second. Three months later he developed a penetrating duodenal ulcer, which healed rapidly on medical management. Gastric acid findings were unchanged during the second hospital admission. He has had no headache for seventeen months.

CASE 4.—*Very severe headache; no relief after four intravenous and many subcutaneous injections.*

Mrs. H., aged 34, stated that the headaches began at 13, the menarche at 13. Her mother, two maternal aunts and two sisters had severe sick headaches. For seven years the headaches occurred only at her menstrual periods; after 20 they increased in frequency, occurring every eight or nine days, lasting approximately thirty hours and causing her to go to bed. During her two pregnancies at 26 and 30 years she was completely free during the second and third trimesters, and during lactation her headaches were infrequent and mild. However, after the children had been weaned the attacks recurred with their same frequency and severity. Her only relief was from injections of ergotamine tartrate. Four intravenous doses of histamine followed by subcutaneous injections of increasing strength have failed to alleviate in any degree the pattern of the attack.

SUMMARY AND CONCLUSIONS

1. Thirty-four patients with severe migraine were treated with intravenous histamine injections. Seven were improved and twenty-four became symptom free.

2. Intravenous histamine should not be given to patients with peptic ulcer or vascular disease and may be dangerous if indiscriminately used.

3. Histamine is nonantigenic, and the body does not become sensitized in an allergic manner either spontaneously or by repeated injections, as may be the case in the higher protein aggregates which are capable of producing antibodies by injection or other routes of assimilation.

4. The observations recorded suggest a new method of attack on many problems which may be due to allergy.

Sectarian Medicine Unwanted.—Your timorous citizen with a backache may still choose to have his vertebrae adjusted; but if his boy is going to stop a bullet he wants him to have a good orthodox surgeon and plenty of penicillin. There are sects and parties now only in those fields in which science has not yet been able to provide general principles, for example in psychiatry and medical sociology. The judgments of everyday doctors, of the health officers and of the military medical staffs are being accepted everywhere with astonishing confidence and no effective sectarian opposition.—Corner, George W.: The Gifts of the Good Physician, University of Rochester, N. Y., 1944.

STREPTOMYCIN FOR TYPHOID

A PHARMACOLOGIC STUDY

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In the search for antibiotic substances which are more bacteriostatic or bactericidal for gram negative bacilli than penicillin, Waksman and his associates isolated two apparently related substances, streptothricin [1] and streptomycin,[2] from the genus Streptomyces, which includes the soil actinomycetes. Of the two, streptomycin, obtained from a strain of Actinomyces griseus, is somewhat more active against certain pathogenic gram negative bacilli, including Eberthella typhosa, and is less toxic for the host.[3] It is also effective in controlling experimental infection in animals with a mixture of Proteus vulgaris and anaerobic streptococcus,[4] and with Pasteurella tularensis, Myocobacterium tuberculosis and Klebsiella pneumoniae.[4a] An opportunity to test the therapeutic effect of streptomycin on typhoid and to study its pharmacology in patients came during a local epidemic which began in December 1944. About 60 cases with eight deaths were reported, all arising from a carrier in a bakery. Because of the limited amounts of streptomycin available, only 5 patients with severe or moderately severe attacks were selected for treatment and study.

Streptomycin hydrochloride was supplied by Merck & Co., Inc., of Rahway, N. J. The potency of the first lots used varied from 110 to 130 units per milligram. A subsequent lot had a potency of 300 units per milligram and the last lot received was increased in potency to 430. The unit of potency is the amount necessary to inhibit the growth of a strain of Escherichia coli in 1 cc. of broth or agar.[5] The unit value seems out of proportion with the unit value of penicillin as measured against a standard strain of staphylococci, so that unitage as now expressed in millions may be readjusted later at a lower level or preferably established on the basis of milligrams of crystalline substance. An average daily dose of 100,000 units of penicillin with a potency

From the Jefferson Medical College and Hospital.
From the Wyeth Institute of Applied Biochemistry (Dr. Elias).

Merck & Co., Inc., supplied streptomycin and outlined the methods for its assay.

1. Waksman, S. A., and Woodruff, H. B.: Streptothricin: A New Selective Bacteriostatic and Bactericidal Agent, Particularly Active Against Gram Negative Bacteria, Proc. Soc. Exper. Biol. & Med. **49:** 207-210 (Feb.) 1942. Waksman, S. A.: Production and Activity of Streptomycin, J. Bact. **46:** 299-310 (April 24) 1943.

2. Schatz, A.; Bugie, E., and Waksman, S. A.: Streptomycin: A Substance Exhibiting Antibiotic Activity Against Gram Positive and Gram Negative Bacteria, Proc. Soc. Exper. Biol. & Med. **55:** 66-69 (Jan.) 1944. Jones, Metzger, Schatz and Waksman.[5] Waksman, Bugie and Schatz.[4]

3. Robinson, H. J.; Graessle, O. E., and Smith, D. G.: Studies in the Toxicity and Activity of Streptothricin, Science **99:** 540-541 (June 30) 1944. Robinson, H. J.; Smith, D. G., and Graessle, O. E.: Chemotherapeutic Properties of Streptomycin, Proc. Soc. Exper. Biol. & Med. **57:** 226-231 (Nov.) 1944.

4. Waksman, S. A.; Bugie, E., and Schatz, A.: Isolation of Antibiotic Substances from Soil Micro-Organisms, with Special Reference to Streptothricin and Streptomycin, Proc. Staff Meet., Mayo Clin. **19:** 537-548 (Nov. 15) 1944.

4a. Heilman, F. R.: Streptomycin in the Treatment of Experimental Tularemia, Proc. Staff Meet., Mayo Clin. **19:** 553-559 (Nov. 29) 1944. Feldman, W. H., and Hinshaw, H. C.: Effects of Streptomycin on Experimental Tuberculosis in Guinea Pigs, ibid. **19:** 593-599 (Dec. 27) 1944. Heilman, F. R.: Streptomycin in the Treatment of Experimental Infections with Micro-Organisms of the Friedländer Group (Klebsiella), ibid. **20:** 33-39 (Feb. 7) 1945.

5. Jones, D.; Metzger, H. J.; Schatz, A., and Waksman, S. A.: Control of Gram Negative Bacteria in Experimental Animals by Streptomycin, Science **100:** 103-105 (Aug. 4) 1944.

of 800 units per milligram weighs about 125 mg., but a daily dose of 4 million units of the best streptomycin of about 400 units per milligram used in this study weighed 10 Gm.

Sterile solutions for intramuscular injection were prepared in distilled water so that each cubic centimeter contained 50,000 units. Accordingly, 2.5 cc. (125,000 units) was injected intramuscularly in different areas at three hour intervals, making a total of 1 million units daily in patients 1 and 2. For patient 3 the amounts were doubled and then quadrupled. Injections of large amounts were painful and required the addition of 1 cc. of 1 per cent procaine hydrochloride solution. Patient 4 received streptomycin intravenously and patient 5 orally. Blood samples were obtained from each patient before treatment, every hour after the first dose for three hours, then every three to six hours for twenty-four hours, and thereafter every twelve to twenty-four hours, to measure the amounts of streptomycin present. Samples were taken from 2 patients every hour for three hours after the last dose and a few subsequent ones at three hourly intervals to determine the rate of disappearance from the blood. The amounts of streptomycin excreted in the urine were measured in daily twenty-four hour collections of urine. In patient 4 the units per gram of feces were measured, and in patient 5 the total output in the feces and its effect on the flora were studied.

The technic of measurement of streptomycin in the blood, urine and stool was based on the agar cylinder-plate diffusion method, using Bacillus subtilis, of Robinson and Smith.[6] Although B. subtilis was the test organism, the unitage in this study is expressed in E. coli units. A detailed report will be given elsewhere.[7]

REPORT OF CASES

Case 1.—C. G., a man aged 31, noted malaise and chilly sensations beginning about Jan. 7, 1945. He remained at work for a week until the increasing severity of symptoms with severe chills, headache and fever confined him to bed. A remission of symptoms occurred about January 20, but fever, chills and drenching sweats recurred two days later. Slight deafness and sordes appeared. He was admitted to the hospital January 25 on the nineteenth day of the disease. The temperature was 105 F., the leukocytes numbered 6,700 and a blood culture contained five colonies of E. typhosa per cubic centimeter of blood, but typhoid bacilli were not cultivated from the stool until later. Sordes and rose spots were present. He was regarded as having a severe attack of typhoid. On the twenty-fifth day his temperature rose to higher level (chart 1) and he became more toxic, with mental confusion and somnolence.

Treatment with streptomycin began on the twenty-fourth day; 125,000 units was injected intramuscularly every three hours, a total of 1 million units a day. There was tenderness at the site of each injection about an hour or so afterward which persisted for several hours, but otherwise no untoward effects were noted. For a short period only 500,000 units was injected over a thirty-six hour period, but the original dosage was resumed during the rest of the ten day period, making a total of about 10 million units. The estimated amounts of streptomycin in the blood increased to about 5 units within six hours and maintained that level. The amounts rapidly diminished several hours after the last injection. From 13 to 56 per cent of the total daily doses was recovered daily from twenty-four hour collections of urine. Traces of streptomycin, estimated as between 2 and 3 units per cubic centimeter, were demonstrable in the spinal fluid on the ninth day of treatment.

Between thirty-six and forty-eight hours after treatment was begun the temperature began to decline steadily and reached normal on the thirty-seventh day. Symptoms and signs abated proportionately. Typhoid bacilli were present in the blood

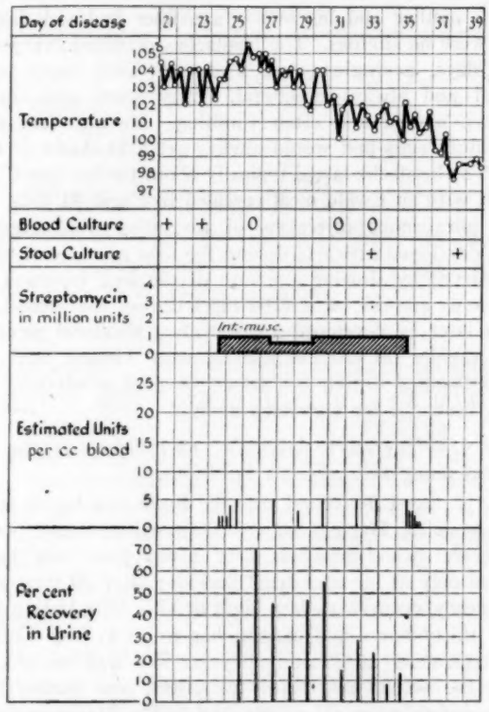
Day of disease
21 23 25 27 29 31 33 35 37 39
Temperature
105 104 103 102 101 100 99 98 97
Blood Culture
+ + 0 0 0
Stool Culture
+ +
Streptomycin in million units
4 3 2 1 0
Int.-musc.
Estimated Units per cc blood
25 20 15 10 5 0
Per cent Recovery in Urine
70 60 50 40 30 20 10 0

Chart 1 (case 1).—Intramuscular injection, 1 million units daily. Gradual decline of fever during therapy, with disappearance of bacteremia. Amounts of streptomycin in the blood are theoretically bactericidal.

before but not after treatment was begun. They were recovered from the stool on the thirty-third and thirty-eighth days, unchanged in their resistance to streptomycin.

Recovery in this patient may have been spontaneous or induced by streptomycin. At any rate the symptoms increased in severity before treatment, and recovery was synchronous with therapy.

Case 2.—M. B., a waitress aged 49, went to bed about January 4 thinking she had a cold because of headache, fever and chills. A few days later diarrhea occurred with several bloody stools. There were rhinorrhea and epistaxis. The general condition became worse and she was admitted to Temple University Hospital as a patient of Dr. John Lansbury[8] on about the twenty-first day of the disease. She had a severe form of typhoid. The leukocytes numbered 4,700, and E. typhosa was present in the stool.

Streptomycin was injected intramuscularly beginning on the twenty-fourth day in doses of 125,000 units every three hours, or 1 million units daily, and continued for about nine days, a total of about 9 million units (chart 2). No clinical improvement occurred during therapy or for several weeks afterward. No evidence of toxicity from streptomycin was noted, but soreness was complained of for a few hours at the injected sites. The amount of streptomycin in the blood increased to 12 units per cubic centimeter within twelve hours after the first injection and remained at approximately that level during treatment. The blood cultures, sterile at first, became positive for E. typhosa during treatment despite the presence of 14 units of streptomycin per cubic centimeter of blood, or double the amount needed to kill the germ in the test tube. After

6. Robinson, H. J., and Smith, D. G.: J. Pharmacol. & Exper. Therap., to be published. Description of an improved method using a strain of staphylococci will be published by Dr. R. B. Stebbins.
7. Elias, W. F., and Durso, J.: Science, to be published.

8. Drs. J. Lansbury and L. W. Whitney allowed us to study this patient and cooperated in her management.

treatment was stopped, streptomycin rapidly diminished and after nine hours could no longer be demonstrated in the blood. From 10 to 28 per cent of the daily dose was excreted in the urine. Streptomycin disappeared from the urine forty-eight hours after the last dose.

Treatment with streptomycin had no beneficial effect and bacteremia persisted probably because of insufficient dosage, although the amount present in the blood was more than enough to kill E. typhosa in broth, or because of some unknown factors which interfere with the action of the drug or protect the bacilli from its effects.

CASE 3.—R. H., a maid aged 24, ate food from the suspected bakery about January 5. A stool culture made during a survey revealed E. typhosa on January 24. The patient was well until January 27, when she noted severe headache, later chilliness which lasted twenty-four hours and malaise for three days, although she continued to work. On February 1 fever, malaise, constipation and nosebleed occurred. She was admitted to the Graduate Hospital of the University of Pennsylvania as a patient of Dr. H. L. Bockus [9] on February 2, the sixth day of the disease. Her temperature was 103 F., the pulse rate was 110 and the leukocytes numbered 4,500. Blood culture made on February 2 and four made thereafter were all sterile. E. typhosa was cultivated from the stool on occasions, as shown in chart 3. During the first four days of observation the patient was not toxic and the attack was regarded as moderately severe.

Streptomycin in larger doses was injected intramuscularly every three hours in 5 cc. (250,000 units) amounts, a total of 2 million units a day, as shown in chart 3. Because of the pain at the site of injection the amount was divided and injected into two places at once. Since no evident clinical improvement occurred, the dose after two days was doubled to 500,000 units every three hours, or 4 million units daily, and injected with 1 cc. of 1 per cent procaine hydrochloride solution. On the nineteenth day of the disease, or the seventh day of treatment, after about 24 million units had been given, the temperature dropped abruptly to normal and recovery ensued. Treatment was stopped one day later because of pain at the sites of injection after a total of about 30 million units had been given. Tender indurated masses at the sites of injection remained for several days, but no evidence of toxicity was noted. E. typhosa was cultivated from the stool during treatment.

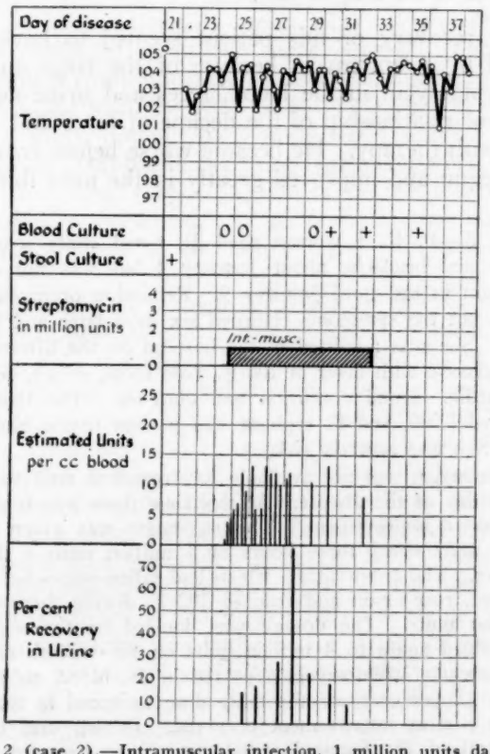

Chart 2 (case 2).—Intramuscular injection, 1 million units daily. No clinical effect from therapy; bacteremia present despite amounts of streptomycin in the blood more than the theoretical bactericidal level.

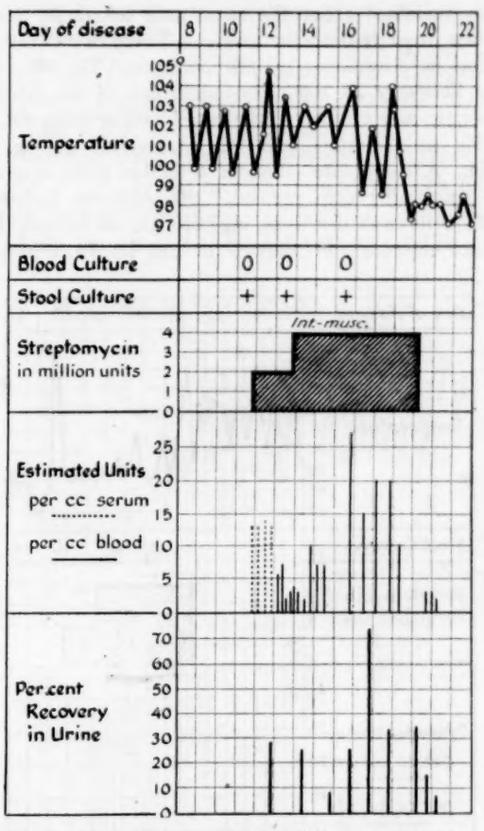

Chart 3 (case 3).—Intramuscular injection with 2 million, then 4 million units daily. Gradual decline of fever after start of therapy and crisis-like end with clinical recovery on the eighth day of treatment. E. typhosa persisted in the feces during treatment.

Streptomycin was present in the blood one hour after the first injection. The first four measurements were made of serum in which the estimated amounts of streptomycin, 13 units, were about double those in the whole blood, as may have been expected. The estimated amounts in the blood during the first three days of therapy averaged about 7 units. After increased dosage larger amounts appeared, as high as 27 units. Amounts at levels higher than 12 units are subject to more accurate measurement.[7] After treatment was stopped streptomycin disappeared from the blood in eighteen hours. Streptomycin appeared in the urine in amounts similar to those in cases 1 and 2, averaging 25 per cent of the amount injected. None was detected in the urine forty-eight hours after the last injection.

Treatment with streptomycin seemed to precipitate a crisis-like termination in this case, although it took seven days to do it. Abrupt recovery is unusual in typhoid.

CASE 4.—M. M., a man aged 60, had typhoid fifty years ago. About Dec. 12, 1944 mild illness thought to have been grip began. The symptoms gradually became worse until severe chills and fever obliged bed rest. He was admitted to the hospital on Jan. 12, 1945 on about the twenty-first day of the disease with fever of 101 F., leukocytes 5,000. A blood culture was sterile. He did not appear to be very sick at first but soon did, with repeated shaking chills and fever of 104 F.

9. Drs. H. L. Bockus and E. Jobb allowed us to study this patient and cooperated in her management.

He was given empirically a total of 200,000 units of penicillin intramuscularly on January 15 and 16 and a course of sulfadiazine January 18, both without effect. On January 19 a massive intestinal hemorrhage occurred. The patient came under our care January 25. E. typhosa was isolated from the stool on this date and from several later ones. Blood cultures and the Widal test gave negative results. The patient's condition remained about the same until about the forty-fifth day, when toxicity became severe. There were restlessness and delusions alternating with somnolence. The stupor deepened by February 24, the sixty-fourth day of the disease, and his condition was critical. Intestinal bleeding recurred.

At this time streptomycin for intravenous use was made available. A daily dose of about 4 million units was injected by the continuous drip method. Streptomycin hydrochloride 1,350,000 units was dissolved in 1,000 cc. of isotonic solution of sodium chloride and allowed to run into a vein in eight

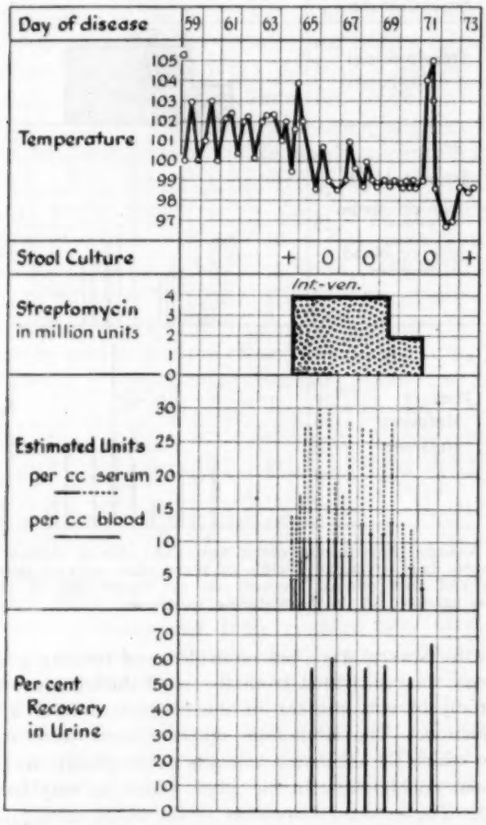

Chart 4 (case 4).—Intravenous injection with 4 million, then 2 million units daily. Abrupt drop of fever twenty-four hours after injection was begun and rapid recovery. Febrile reaction on the seventy-first day may have been caused by impurities in the drug. High levels of streptomycin in the blood and 130 units per gram of feces (not shown in the chart) were present. The feces were free of typhoid bacilli until four days after treatment, when only 40 units per gram was present.

hours, then replaced by similar second and third preparations during twenty-four hours. For every third thousand cubic centimeters 10 per cent glucose solution was substituted for the salt solution to reduce the danger of edema. A slight chill occurred about five hours after the injection was begun, but this had also occurred after many previous injections of blood or of fluid with salt, sugar or amino acids. As noted in chart 4, a few hours after the injection was begun the temperature rose as it had many times before, but twenty-four hours later it touched 98.6 F., coincident with a fall in pulse rate from 120 to 95 per minute. Striking clinical improvement occurred in the next thirty-six hours, the temperature declined and the patient became cooperative, oriented and alert. By the fifth day of treatment recovery seemed established and the daily dose was reduced to 2 million units to conserve the supply. A slight recrudescence occurred on the eighty-fourth day, lasting three days.

After seven days of treatment and apparent recovery the patient had a chill, followed by fever rising within a few hours to 105 F., restlessness and stupor. Intravenous therapy was stopped after about 23 million units had been injected. The temperature returned to normal after twelve hours, became subnormal and was accompanied with a shocklike state lasting about twelve hours, followed by recovery. Since there had been about fourteen similar but less severe episodes during the ten weeks of sickness it was impossible to decide whether the last one was a similar one or if it was a reaction to streptomycin. A sample of the streptomycin used when injected into 2 rabbits by the standard U. S. P. XII method caused fever in both, indicating the presence of a pyrogen.

With intravenous therapy the amount of streptomycin in the blood rose to an estimated 4.5 units one hour after the injection was begun and within twelve hours reached 10 units, a level maintained while the dosage was 4 million units. The amounts recorded in the serum were consistently higher, up to 30 units per cubic centimeter. After the dosage was reduced to 2 million units the amounts in the blood fell rapidly, as shown in chart 4. About 60 per cent of the daily dose was excreted in the urine.

Because of difficulty in collection the total daily stool was not weighed, but measurements on samples showed streptomycin in amounts of 105 units and 130 units per gram (0.1 to 0.13 unit per milligram) on the fourth and fifth days of treatment with 4 million units. The amount dropped to 80 units when the dosage was reduced and to 40 units two days after treatment was stopped. At this time typhoid bacilli reappeared in the feces, suggesting that too little streptomycin was present to suppress their growth and that some factors interfered with the action of the drug on the bacilli.

The recovery of this patient seemed to have been caused by streptomycin because of the large amounts of streptomycin in the blood, feces and urine and the apparent relationship of the decline of fever and symptoms with therapy. He became worse before treatment was begun and improved greatly in the next thirty-six hours.

Case 5.—P. F., a woman aged 21, noted chilly sensations, malaise and headache about January 4 but was not obliged to remain in bed until January 9. Remission occurred January 13, but the symptoms returned six days later and became severe. She was admitted to the hospital on the fifteenth day of the disease with fever of 106 F., rose spots, cough, deafness, bradycardia, mental confusion and diarrhea. The leukocytes numbered 7,000, and E. typhosa was present in the blood and feces. She was severely sick.

Streptomycin was not available for treatment until the fifty-seventh day of the disease. At this time there was temporary spontaneous improvement. The substance was given orally, 125,000 units every three hours or 1 million units a day for five days. The temperature, which had fallen somewhat before treatment, rose again and reached 102 F. during therapy with 1 million units. The dosage was doubled on the sixth day and doubled again to 4 million units on the seventh day, but no measurable streptomycin appeared in the blood, only traces (0.8 to 1.2 per cent) of the daily dose appeared in the urine and no clinical improvement occurred. During oral therapy almost all of the ingested streptomycin was excreted in the stools. On the fifth day of therapy 72 per cent was present (4 units per milligram) and on the sixth day 110 per cent, the latter probably due to accumulation from the previous day which was recovered by enema. With 4 million units given orally, the amounts in the stools increased to 10 and 19 units per milligram. At the same time, striking changes occurred in the flora of the feces as determined by Dr. G. H. Warren. In a specimen cultured before therapy, E. typhosa and E. coli were present in large numbers. After one day of oral therapy E. typhosa disappeared and E. coli was greatly lessened.

After several days of oral therapy E. coli was almost completely eliminated and the stools lost much of their fecal odor.

The temperature continued to rise and oral therapy was replaced by intravenous injection in amounts of 2 million units for two days and 4 million units for four days, when the supply was exhausted.

Within a few hours after continuous intravenous injection streptomycin appeared in the blood and urine in amounts comparable to the preceding cases (chart 5), but the amounts in the feces diminished until only a trace, 145 units per gram, was present after four days. At this time typhoid bacilli reappeared, E. coli increased in numbers and on test the former were found to be just as sensitive to streptomycin as those isolated before treatment.

The result of therapy with streptomycin in this case is difficult to judge. Oral therapy was ineffective. The temperature, after intravenous injection was begun, rose even higher for a few days and then declined at a time when, unfortunately, no more drug was available. It rose again after treatment was interrupted, although the patient had no complaints. Several explanations may be offered: (*a*) The fever may represent the natural course of the relapse, (*b*) the temperature may have been increased from the sixty-fifth to the seventieth day by pyrogenic impurities in the drug and (*c*) it rose again on the seventy-second day because insufficient amounts of streptomycin were given or therapy was stopped too soon. Perhaps, as in other systemic infections, specific therapy to be effective must be given earlier in the disease, yet in case 4 a favorable effect seemed to follow treatment on the sixty-fourth day.

It is assumed that E. typhosa recovered from each patient was of the same strain, since all five were apparently infected from the same source. The bacillus obtained from both blood and feces of patients 1, 2 and 3 and from the feces of patients 4 and 5 was killed by 6 units, but not by 4 units when standard suspensions of 1,000 bacilli per cubic centimeter were incubated at 37 C. for forty-eight hours in the test tube. A laboratory stock strain of E. typhosa was found to be more sensitive to streptomycin; growth was inhibited by 1 unit.

Attempts were made to discover why in case 2 no clinical improvement occurred and E. typhosa was still present in the blood, which contained 10 to 13 units of streptomycin per cubic centimeter, or twice the bactericidal amount necessary (6 units) in the test tube. The sensitivity to streptomycin of bacilli obtained before treatment began was compared with that of bacilli obtained from the blood after nine days of treatment, but both were killed by 6 units and not by 4 units. Exposure to streptomycin in the body, therefore, did not increase their resistance. A similar test of bacilli from patients 1, 4 and 5 gave the same result.

Further trial was made to see if 10 per cent normal human serum in broth interfered with the bacteriostatic effect of streptomycin as it does with penicillin,[10] but in this medium as little as 2 units but not 1 unit caused inhibition. If anything, serum enhanced the bacteriostatic effect. It is probable that other inhibitory factors are operative in the body.

Toxic Effects.—Except for a brief rise in fever a few hours after beginning intramuscular or intravenous injection in each case, which may have been caused by extraneous pyrogenic impurities, there were no other toxic effects of streptomycin. The severity of the disease may have masked mild toxic symptoms had they occurred. It is possible that the late reaction in case 4 was due to pyrogen. No exanthem developed, the erythrocytes, leukocytes and blood pressure changed no more than would be expected in typhoid, and no abnormalities appeared in the urine or feces. The urea clearance tests in each case after therapy and again two weeks later gave normal results.

Routes of Therapy.—Intramuscular injection in cases 1, 2 and 3 caused enough streptomycin to enter the blood and urine to inhibit, theoretically, the growth of E. typhosa in either fluid but failed to sterilize the blood in case 2. E. typhosa was present in the feces in all 3 cases during treatment. Traces of streptomycin estimated as between 2 and 3 units per cubic centimeter appeared in the spinal fluid of 1 patient given 1 million units daily.

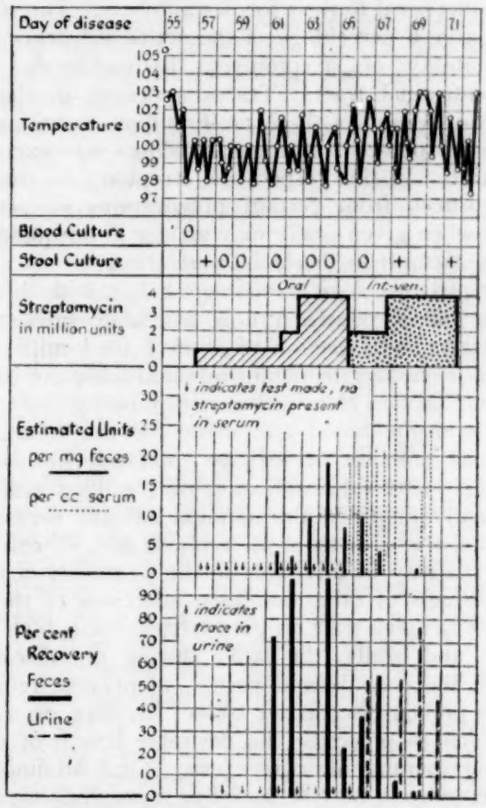
Day of disease
55 57 59 61 63 65 67 69 71
Temperature
105° 104 103 102 101 100 99 98 97
Blood Culture
Stool Culture
Streptomycin in million units
Oral
Int-ven.
4 3 2 1 0
Estimated Units per mg feces
per cc serum
30 25 20 15 10 5 0
indicates test made, no streptomycin present in serum
Per cent Recovery
Feces
Urine
90 80 70 60 50 40 30 20 10 0
indicates trace in urine

Chart 5 (case 5).—Oral therapy, 1 to 4 million units for nine days, then intravenous injection 2 million and 4 million units daily for six days. During oral therapy almost all streptomycin was excreted in the stool; only traces were present in the blood and urine. During intravenous injection the amounts rapidly increased in the blood and urine and disappeared from the stool after four days. Treatment was begun during a relapse on the fifty-sixth day. It is possible that the temperature may have become normal on the seventy-third day had more streptomycin been available.

Intravenous injection of large amounts in case 4, as expected, promptly caused large amounts in the blood and the excretion of 60 per cent of the daily dose in the urine. From 19 to 30 units per cubic centimeter of serum and from 400 to 1,000 units per cubic centimeter of urine were present. The amount in the blood was at times more than double the amount needed to kill typhoid bacilli in the test tube, and in the urine one hundred times more. These amounts are about the same as those obtained during intramuscular therapy in cases 2 and 3 and during intravenous injection in case 5. From 105 to 130 units per gram (0.1 to 0.13 unit per

10. Bigger, J. W.: Inactivation of Penicillin by Serum, Lancet **2**: 400-412 (Sept. 23) 1944.

milligram) appeared in the feces. This quantity freed the feces of E. typhosa; but three days after therapy was stopped, while 40 units per gram (0.04 unit per milligram) of streptomycin was still present, the bacilli were again isolated. Apparently more than 40 units per gram of feces is necessary to inhibit growth.

Oral therapy in case 5 resulted in the excretion of almost all the streptomycin in the stool, the elimination of E. typhosa and a great reduction in the numbers of E. coli and of the odor of the feces. With doses of 1 million units, 4,000 units per gram (4 units per milligram) appeared in the feces, and with 4 million units, 19,000 units per gram (19 units per milligram). Soon after oral therapy was stopped the amounts fell rapidly and only traces were present in the feces four days later. Typhoid bacilli then reappeared and colon bacilli increased to their former numbers. The recovery of so large a percentage of the active substance proves the stability of streptomycin hydrochloride in the gastrointestinal tract. Traces appeared in the blood after oral doses of 1, 2 or 4 million units and only 0.8 to 1.2 per cent of the daily doses was excreted in the urine. In this respect the streptomycin compound used differs from certain preparations of penicillin, which when given orally may appear in adequate therapeutic strength in the blood and urine.[11]

The pharmacologic data suggest that, with the preparations of streptomycin now available, intramuscular or intravenous injection of from 1 to 4 million units daily is necessary to obtain minimal adequate bacteriostatic or bactericidal amounts (6 units per cubic centimeter) in the blood and urine for the treatment of systemic infection or urinary tract infection with E. typhosa. Oral administration of 1 million units daily apparently provided the minimal amount necessary to suppress the growth of E. typhosa and E. coli in the feces. It may be advisable in the treatment of typhoid and perhaps of other bacillary infections of the intestinal or urinary tract to give streptomycin both parenterally and orally, the latter during the disease and also in the convalescent period, to prevent reinfection and to prevent the carrier state. No data are available by which to prescribe the desirable length of time to prolong therapy after recovery. Oral administration of streptomycin may be useful as a prophylactic method under certain circumstances to prevent typhoid or other bacillary infections.

It is unsafe to judge the therapeutic value of streptomycin in the study of only 5 cases of typhoid, a disease of unpredictable severity and duration. But the presence of streptomycin in the blood, urine and feces in amounts more than enough to kill typhoid bacilli in the test tube, and the clinical improvement during therapy of 3 patients selected because of the severity of their attack, strongly suggest that the substance contributed to their recovery, if it did not actually cause it.

In case 1 gradual recovery coincided with the period of treatment and the drug may or may not have been curative. The failure of therapy in case 2, in which bacteremia persisted, cannot be explained except on the probable basis of inadequate dosage or by the presence in the body of substances inhibiting the effect of the drug. Streptomycin in the blood during bacteremia was in double the amount necessary to kill typhoid bacilli in broth culture. E. typhosa from the patients studied did not become resistant to streptomycin by exposure to it nor did serum protect the bacteria in test tube experiments. In cases 3 and 4 the abrupt end of the fever and recovery seemed to be brought about by the presence of large amounts of streptomycin in the blood. Spontaneous crisis-like recovery is unusual in typhoid. In case 5 treatment started orally on the fifty-seventh day at the beginning of a relapse had no clinical effect but cleared gram negative bacilli from the feces. Intravenous therapy caused large quantities of streptomycin to appear in the blood and was first accompanied by a rise of fever and then its fall toward normal. Its subsequent rise perhaps occurred because treatment could not be continued.

From the evidence at hand in 5 treated typhoid patients it can be said at present that streptomycin offers much promise as a substance capable of sterilizing the blood stream and urinary tract when injected in sufficient amounts parenterally, and of eliminating typhoid bacilli from the feces when given orally. Recovery of 3 patients during therapy suggests the therapeutic effectiveness of streptomycin for typhoid. In the present study streptomycin was not available until the epidemic was advanced and treatment was begun late in the disease. Perhaps earlier treatment in adequate parenteral and oral dosage would have provided better results.

Preparations of streptomycin are more stable than of penicillin, but in comparison with penicillin its unitage and bulk are far greater. When it is further purified or concentrated, streptomycin will probably not be any more toxic than penicillin. It is probable that substances are present in the body which inhibit to some extent the influence of streptomycin on E. typhosa.

SUMMARY

Streptomycin, a nontoxic antibiotic substance derived from Actinomyces griseus, when injected intravenously or intramuscularly in doses of from 1 million to 4 million units daily appears in the blood and urine in patients with typhoid in amounts theoretically sufficient to kill E. typhosa. Small quantities are excreted in the feces. When given orally, only traces appear in the blood and urine, and most of it is excreted unchanged in the feces in quantities excessive to suppress E. typhosa and E. coli. Both parenteral and oral therapy seem to be desirable in treating typhoid, the one to control systemic and urinary tract infection, the other to sterilize the feces, to prevent reinfection and to avoid the carrier state. There is evidence that different strains of E. typhosa vary in their resistance to streptomycin, but there is no evidence here of the development of increased resistance to streptomycin during exposure to it in the body.

Of 5 patients treated parenterally with streptomycin, recovery took place in 3 during treatment.

11. Libby, R. L.: Oral Administration of Penicillin in Oil, Science **101**: 178-180 (Feb. 16) 1945. György, P., and others: Administration of Penicillin by Mouth, J. A. M. A. **127**: 639-642 (March 17) 1945.

Sneezing.—Aristotle wrote that a sneeze was regarded as divine, and the Greeks of that age said "Zeus preserve you" to a sneezer. The corresponding Latin expression, according to Petronius Arbiter, was "Salve." The old Jewish formula is "Chayim Tobim" ("Good Life"), and the Moslem says "Sihhaten" ("twice health"). The modern "God bless you," "A vos souhaits," "Gesundheit," "Salud" and the like are relics of ancient superstition based on the idea that spirits are hovering everywhere.—Gordon, Benjamin Lee: The Romance of Medicine, Philadelphia, F. A. Davis Company, 1944.

PREGNANCY COMPLICATING DIABETES

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BOSTON

Recent published reports indicate that obstetric and diabetic clinics now agree that whereas the maternal mortality in diabetic pregnancies has been low fetal mortality has been high. The past fetal mortality rates have ranged from 30 to 60 per cent, depending on the length of pregnancy observed. If the study has been limited to the third trimester, the usual rate has been 30 per cent. If the entire period of pregnancy has been reported, it has been as high as 60 per cent.

The long period of observation of diabetic pregnancies by obstetricians and internists has revealed four salient abnormalities. These four abnormalities may be classified simply as first, maternal; second, obstetric; third, chemical, and fourth, fetal. My purpose in this discussion is to evaluate these abnormalities as they have occurred in a series of 181 consecutive diabetic pregnancies studied at our clinic between January 1936 and June 1944. In this series of cases there were one maternal and twenty-nine fetal deaths.

The prepregnancy abnormalities are two: vascular disease and hypo-ovarianism. Vascular disease is almost inevitable in young diabetic patients in whom the duration of diabetes exceeds fifteen years. Such patients comprise a large percentage of our own obstetric group and will soon comprise obstetric diabetic groups generally. It is now well established that arteriolar sclerosis as well as atherosclerosis occurs in diabetes. We find such involvement in the kidneys and eyes, as well as the better known lesions in the heart, aorta, the vessels of the extremities and the brain. Today nephritis has replaced sepsis and is replacing coma as a cause of death of young diabetic patients.

Ovarian failure is indicated by an increase in the serum level of follicle stimulating hormone, by amenorrheas and metrorrhagias. All of these are observed more and more frequently in young diabetic women. Atrophy of the ovary with poor follicular development is the only consistent pathologic change reported in the endocrine glands other than the changes observed in the pancreas itself. Thus, in spite of an outward appearance of youth and well-being, in obstetric diabetes we are dealing too often with a physically and gynecologically aged individual.

The abnormal obstetric course of pregnant diabetic patients is well known. The striking abnormalities are five: the easy, early spontaneous interruption of the pregnancy occurring in at least 25 per cent of the cases, the high incidence of preeclamptic toxemia occurring in 36 per cent, breech presentation in 33 per cent, uterine inertia common and failure of lactation in nearly 100 per cent. A normal obstetric course in patients with diabetes of long duration is almost conspicuous.

The chemical abnormalities which concern us here are (1) the low renal threshold for glucose, (2) water retention and (3) the imbalance of the sex hormones of pregnancy. The low renal threshold for glucose, which is physiologic for pregnancy, complicates the disease diabetes. The loss of glucose in the urine may exceed 100 Gm. per day, even with nearly normal levels of blood sugar. If uncorrected, this predisposes the patient to acidosis and, if overcorrected, to insulin hypoglycemia. Profound disturbance of water balance characterizes pregnancy in diabetic patients. This is shown clinically by the great gain in weight, visible maternal edema, hydramnios and fetal edema. An imbalance of the sex hormones of pregnancy, fall of pregnandiol and rise of chorionic gonadotropin has occurred in 70 per cent of the 181 cases under discussion here.

Fetal abnormalities are physical, chemical and pathologic. A birth weight above the average for the period of gestation has been found in 80 per cent of the infants of diabetic mothers. The size of the infant appears to be due to three distinct factors: obesity, edema and splanchnomegaly, the liver, spleen and heart being especially involved. The second physical abnormality is the high incidence of congenital defects usually involving tissue which is mesenchymatous in origin.

On the first postnatal day respiratory, sugar and temperature regulatory difficulties may be encountered, and forty-eight hours after delivery the universal occurrence of jaundice.

The pathologic characteristics of the infants of diabetic mothers are almost diagnostic of maternal diabetes. They are enlargement of the liver, spleen and heart, excessive hemopoiesis of the liver and spleen and islet hyperplasia.

All of these four abnormalities, maternal, obstetric, chemical and fetal, contribute to the complications of obstetric diabetes. Some of them we can exclude as not being of prime importance and others we can include as being of prime importance. Thus the diabetic emergencies coma and hypoglycemia have played no role in the unfavorable fetal outcome in this series of patients, and congenital anomalies contributed to a fetal death but once. In this series imbalance of the sex hormones of pregnancy appears to be the most important single harmful factor. In this series it is related to premature delivery, toxemia, disturbance of water balance and the abnormal fetus. Thus, when the hormonal balance was normal, as it was in 52 of our 181 cases, the incidence of premature deliveries was zero, the incidence of toxemia of pregnancy 2 per cent, and the fetal survival approached that of nondiabetic pregnancies, 96 per cent. In contrast to this experience, in 38 cases in which an abnormal hormonal balance was observed premature delivery occurred in 40 per cent, preeclamptic toxemia occurred in 50 per cent and the fetal survival was 50 per cent. Since the imbalance of the sex hormones of pregnancy occurred in abnormal clinical cases with poor fetal survival and the production of a characteristic fetus, an attempt was made in 91 cases to correct the imbalance, to see if premature deliveries could be prevented, toxemias altered or averted, fetal survival raised and a normal fetus produced. In the group so treated the incidence of premature delivery fell to 15 per cent, preeclamptic toxemia appeared to be altered and prevented and fetal survival rose to 90 per cent. It is difficult to measure the effect of hormonal correction on the incidence of toxemia in this series of cases, for the early ones were treated only after symptoms of toxemia had developed. In the past few years the therapy has been inaugurated on chemical evidence only and the incidence of toxemia in the latter group has fallen to 5 per cent.

From this study the rules for the management of the pregnant diabetic patient in our clinic have been evolved. Obviously not all of our cases have been treated in the same fashion. This management is

From the George F. Baker Clinic of the New England Deaconess Hospital, Elliott P. Joslin, medical director.
Read before the Section on Obstetrics and Gynecology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

diabetic, obstetric, endocrine and pediatric. The diabetic diet should be liberal in calories, 30 per kilogram of actual body weight, high in protein, 2 Gm. per kilogram of body weight, and adequate in carbohydrate, up to 200 Gm. daily, 150 for the mother and 50 for the fetus. Because of the low renal threshold multiple small doses rather than a single large dose of insulin have been employed. Sodium chloride intake is restricted and in abnormal cases ammonium chloride is administered.

The delivery in the abnormal cases is premature, the time of choice being the latter part of the thirty-seventh or the early part of the thirty-eighth week. Cesarean section for this particular group is my personal choice. The anesthesia is spinal and sedation is prohibited.

Various forms of endocrine therapy and various routes of administration have been used in this series of 181 cases. The best and most economical to date is diethylstilbestrol intramuscularly and progesterone intramuscularly. The average daily dose of each is 15 mg. The infant requires more than average drainage, mechanical stimulation, dehydration, heat and oxygen.

COMMENT

The reason for the abnormal clinical course of diabetic pregnancies may be sought in the abnormal physical, endocrine and chemical background of the diabetic woman. It does not seem illogical to argue that these make her liable to a disturbance of the sex hormones of pregnancy, which imbalance accounts for the high incidence of early, spontaneous, interrupted pregnancies, preeclamptic toxemia, uterine inertia and failure of lactation. Not only does this hormonal disturbance alter the course of pregnancy, but it may be responsible for the production of the abnormal fetus, contributing to fetal edema, splanchnomegaly and excessive hemopoiesis. The fetal survival and the clinical course have undergone a profound change with substitutional estrogen and progesterone therapy. Spontaneous correction of the imbalance can occur. Many women without diabetes can probably compensate and correct such an imbalance. The diabetic patient with a suboptimal hormonal production and metabolism can rarely correct this imbalance spontaneously.

CONCLUSION

Maternal survival in a series of 181 consecutive diabetic pregnancies was 99.5 per cent. Fetal survival for the total series was 84 per cent, but it varied with the occurrence of normal or abnormal balance of the sex hormones of pregnancy. If the sex hormones of pregnancy were abnormal and uncorrected, fetal survival was 50 per cent; if they were abnormal but corrected, 90 per cent; and if they were normal, 96 per cent.

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ABSTRACT OF DISCUSSION

Dr. Henry Dolger, New York: I am not an obstetrician, but anybody who has treated diabetes has been appalled by the fetal mortality among diabetic patients. At the Mount Sinai Hospital the results in the clinic in the past four years have been most unsatisfactory, with not a single fetal survival. None of the patients received endocrine therapy and despite careful control of the diabetes they all went on to ultimate eclampsia or to spontaneous delivery of a macerated fetus. Dr. White's paper is important for two reasons: First, it is a remarkably large series to be produced by one group (I believe that Dr. White and the obstetrician and pediatrician attended each one of the patients). Second, so many of these patients have been delivered spontaneously. There are some who feel that most diabetic patients will deliver spontaneously with little or no attention to the diabetes. In Chicago some claim they can deliver a living baby to any diabetic patient just by cesarean section in the thirtieth week, which is quite radical. On the other hand Miller, Hurwitz and Kuder published a most pessimistic article regarding pregnancy in diabetes. They stated that the fetal and neonatal mortality among diabetic patients was four to five times that among nondiabetic women and that this increased fetal and neonatal mortality was evident even twenty years before the onset of the diabetes. This could not be corroborated by analysis of our clinic material. We found that before patients developed the clinical picture of diabetes they did not have any increased fetal or neonatal mortality, and this, I believe, agrees with Dr. White's data indicating that women are normal in their childbearing capacity until they develop diabetes. The concept of hormonal imbalance is not yet generally accepted as the etiologic factor in abnormal diabetic pregnancy. Nevertheless Dr. White's successful results speak for themselves and have not been duplicated anywhere. It may be that there is more to this than just endocrine therapy—I believe that an important factor is the close cooperation of internist, obstetrician and pediatrician, which exists so uniquely in Dr. White's clinic.

Dr. William J. Dieckmann, Chicago: I am familiar with the work from Dr. White's and Dr. Joslin's clinic, and I have no question as to their treatment of diabetes. I do question the termination of pregnancy early. My associates and I have not been practicing it, and while our fetal mortality is rather high in diabetes, it is not as high as 50 per cent, as I recall Dr. White gave in the untreated cases. We have not used any endocrine therapy for our patients. When Dr. White some years ago, working with the Smiths, first suggested the use of endocrine therapy, I believe I asked her if it was not the excellent antepartum care which she and the obstetricians in charge were giving these patients rather than the endocrine therapy. I believe she will answer in the negative, but I hope in closing that she will elaborate on this point. I believe the only other clinic in the country that feels as she and her group do with regard to premature termination of pregnancy is Dr. Wilder of the Mayo group. If we find severe toxemia developing in the diabetic patient we do terminate prematurely, but in the well treated diabetic patient who presents no evidence of toxemia we do not terminate before term, and then we prefer the patient to go into labor of her own accord.

Dr. R. Carrasco-Formiguera, Puebla, Mexico: There is only one point I wish to stress, about people being or not being normal and the correction of diabetes before pregnancy. It has been my experience (and I shall be glad to know what Dr. White's experience and opinions are in these people) that the fact has been observed of abnormally big babies having been born to a great number of diabetic patients. That was noticed so far back as twenty or more years before diabetes was discovered. This happens in such a large proportion of the cases that it cannot be devoid of significance. I am almost sure that this significance has something to do with the relation between the diabetes and the endocrine balance.

Dr. Priscilla White, Boston: As far as the good results or relatively good results in our clinic being due to the patients' antepartum diabetic care, I do not really think that is the answer because at regular intervals, for financial reasons, I am forced into a control period when the patients will receive exactly the same medical and obstetric care without endocrine treatment, and our statistics fall back to the lower levels we observed prior to 1938. Whatever produces diabetes is probably a long, slowly acting mechanism, so that it is logical to believe that some diabetic women will have abnormal pregnancies prior to diabetes probably for much the same reason that exists after the onset of diabetes. I cannot make a comparison of such statistics in our own series of patients because our obstetric practice is largely derived from our former juvenile diabetic patients, and so the first pregnancy is usually a diabetic pregnancy.

Clinical Notes, Suggestions and New Instruments

SEVERE ASTHMA: DELAYED SENSITIZATION TO PENICILLIN

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Penicillin has been widely acclaimed for its lack of unpleasant or dangerous side effects, so that occasional reactions probably due to it may be overlooked as coincidental. Several references to allergic manifestations accompanying or following the administration of penicillin call attention to the occasional simulation of serum sickness.[1] From the published accounts it appears that not one of these reactions has been alarming. It is our purpose in reporting the following case to describe an allergic reaction of unusual severity:

G. L. S., a white man aged 24, was admitted to the Hampton Roads Medical Center, Norfolk, Va., on July 28, 1944 for the treatment of primary syphilis. Aside from the penile ulcer and inguinal adenitis, the complete physical examination was normal. Family and past histories revealed that neither he nor any close relatives had suffered from allergic disease, even in mild form. On admission, dark field examination of the lesion disclosed Treponema pallidum, and the Kahn standard precipitation test for syphilis was positive (80 Kahn units). The hemoglobin and the white blood cell count were normal, and no eosinophils were reported in the differential count. The urine was cloudy and contained a trace of albumin, 45 pus cells and 1 red blood cell per high power field but no casts. The cerebrospinal fluid was normal.

The patient was treated for eight days with penicillin dissolved in 5 per cent dextrose in distilled water. The total dose was 2,400,000 units divided into sixty doses of 40,000 units administered intramuscularly at intervals of three hours. Two batches of penicillin were used, each the product of a different manufacturer, and the solvent was a solution commercially prepared for parenteral use. At the end of treatment the penile ulcer was epithelized, the urine normal and the serologic test for syphilis positive (20 Kahn units). The patient had experienced no unpleasant symptoms during the treatment and was discharged from the hospital on Aug. 7, 1944 clinically and symptomatically improved.

Forty-eight hours later, on August 9, he was readmitted because of asthma, giant urticaria, fever and malaise which had begun that morning. He was very uncomfortable, complaining chiefly of the intense pruritus. There were large wheals scattered over the entire body, including the palms and soles, so that he could not make a fist and walking was painful. Auscultation revealed generalized wheezing rales throughout both phases of respiration. The heart sounds were not clearly heard because of the asthma but did not seem abnormal. The temperature was 102 F., pulse rate 110 and respiratory rate 20.

Epinephrine in oil 1 cc. intramuscularly twice daily on August 9 and August 10 produced a gratifying subsidence of symptoms except for a very mild exacerbation each evening. There was a remarkable association between the height of the fever and the intensity of urticaria and asthma. On the evening of August 11 the symptoms were worse and the temperature was rising. Reexamination at that time disclosed patches of urticaria, a reddened tongue and injected pharynx, but no abnormality of the tonsils, the chest full of musical rales, generalized adenopathy and tenderness of the entire upper abdomen. The spleen was not identified. Following additional epinephrine and sedation the patient spent a comfortable night and throughout the next day appeared to be improving rapidly and desired to return home.

Suddenly, shortly before 8 p. m. on August 12 he had a seizure of coughing and when examined a few minutes later was found to have breath sounds obscured by wheezing rales. The temperature was 103 F. and the pulse rate 104. He rapidly became weak, the pulse rate rose to 150 and the blood pressure could not be measured. He became comatose and mildly cyanotic and the rectal temperature rose to 105 F. He was not expected to survive the attack but responded dramatically to 1 cc. of aqueous epinephrine followed by 50 cc. of 50 per cent dextrose intravenously. Oxygen was not used because it was not available at that time. By 10 p. m. he was fully responsive, the temperature had begun to decline and the blood pressure was 140/80. His only complaint was weakness and intense thirst. He slept well the remainder of the night, and in the morning the temperature and pulse were normal and there was only an occasional rale on deep inspiration. The heart sounds were normal. The patient felt well and from then until discharge on August 15 he had no further allergic symptoms but was given phenobarbital ½ grain (0.032 Gm.) and ephedrine sulfate ⅜ grain (0.024 Gm.) prophylactically. Laboratory work was not available during the worst of the attack, but several hours after it the only unusual feature was an eosinophilia of 8 per cent.

On August 14 a scratch test was performed. Neither of the two lots of penicillin with which the patient was treated was still available for use in skin testing, but the product of a third pharmaceutical company, in a concentration of 20,000 units per cubic centimeter, gave a negative result.

One cannot infer from this experience that the sensitizing agent was the active principle of the commercial penicillin. It does suggest that there are substances in commercial penicillin which are capable of producing sensitization leading to allergic manifestations of alarming intensity. We were impressed by the delay in development of sensitivity and the remarkable resemblance of the clinical picture to that of serum sickness. As pointed out by Feinberg,[2] refinements in manufacture will allow the production of the active therapeutic agent freer from foreign substances, so that sensitization may be still more unusual in the future.

1. Criep, L. H.: Allergy to Penicillin, J. A. M. A. **126**: 429 (Oct. 14) 1944. Lyons, C.: Penicillin Therapy of Surgical Infections in the U. S. Army, ibid. **123**: 1007 (Dec. 18) 1943. Feinberg.[2]

2. Feinberg, S. M.: Penicillin Allergy: The Probability of Allergic Reactions in Fungus-Sensitive Individuals, J. Allergy **15**: 271 (July) 1944.

DELIVERY OF QUADRUPLETS BY CESAREAN SECTION UNDER CONTINUOUS SPINAL ANESTHESIA

JOHN C. ULLERY, M.D., PHILADELPHIA

The incidence of quadruplets varies in different countries. Guzzoni in 1889 published an analysis of 50,000,000 births in which quadruplets occurred once in 757,000 births. In 1895 Hellin, whose work was based on South German statistics, suggested the following easily remembered ratios: twins once in 80 births, triplets once in 80 × 80 (6,400 births and quadruplets once in 80 × 80 × 80 (512,000) births. Greulich[1] published in 1930 a study of more than 120,000,000 births reported from twenty-one countries between 1915 and 1925. He found that quadruplets occurred once in 670,734 (87.5[3]) births. According to these statistics about five sets a year should be born in the United States. The report here is of quadruplets born on Nov. 1, 1944 by cesarean section. A survey of the literature fails to reveal any previous quadruplets in which cesarean section was performed.

The history of the mother is important, as it reveals the indication for the cesarean operation. Mrs. K. C., white, aged 31, was delivered by cesarean section two years before, following a severe, rapid abruptio placentae. She had a normal antepartum course in this, her first, pregnancy. On Sept. 8, 1942, when only two weeks from term, she developed severe pain

From the Lying-In Unit of the Pennsylvania Hospital.

1. Greulich, W. W.: The Incidence of Human Multiple Births, Am. Naturalist **64**: 142 (Jan.-Feb.) 1930.

in the abdomen. Despite immediate cesarean section the baby was stillborn, and the placenta separated with a large retroplacental clot and much infiltration of blood throughout the uterus, both tubes and ovaries, and extending out to the lateral pelvic walls. The uterus contracted well and was closed without complications.

Her postpartum period was quite stormy and her temperature remained elevated from 104 to 106 F. for twelve days. She eventually recovered and was discharged four weeks after operation.

In this pregnancy the last menstrual period was March 12, 1944, with the expected date of confinement Dec. 19, 1944. During the first four months of the antepartum period there was considerable nausea and vomiting and it was necessary to hospitalize the patient for a week in June for pernicious nausea. She responded well and was discharged improved.

In August the uterus was found to be larger than normal for the duration of pregnancy, the fundus extending three

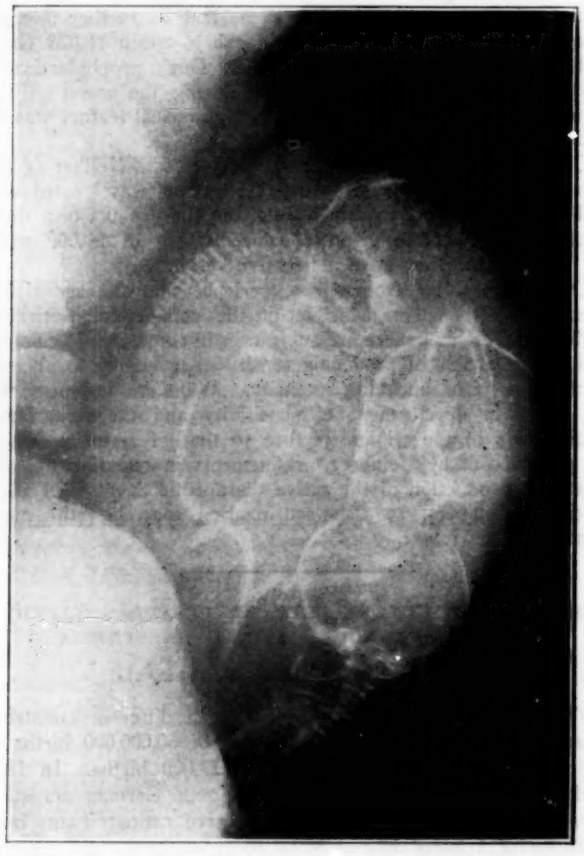

Fig. 1.—Appearance of four fetuses.

fingerbreadths above the umbilicus, and x-ray examination revealed the presence of four fetuses (fig. 1). She was immediately hospitalized and remained there until three weeks after her delivery. During this time her uterus enlarged rapidly, until near the termination it was difficult for her to turn from side to side. She was given a high vitamin diet and progesterone 5 mg. every other day, plus iron and extra vitamins.

On October 24 she began to have some irregular uterine contractions and the uterus became quite tense. This continued for several days, and repeated x-ray examinations gave the estimated weight of the babies as approximately 3 pounds (1.3 Kg.) each. Because of the previous cesarean section and the stormy convalescence, it was felt that possible rupture of the uterus might be imminent and that any labor might precipitate this condition. Another cesarean section offered the safest procedure to avert it.

The choice of anesthesia was considered important, and continuous, fractional, spinal was chosen for its low toxicity and safety and as it does not cause narcosis or anoxemia to the baby. This was especially important, as one of the great causes of death of premature infants at birth is anoxemia from narcotizing anesthetics.

Accordingly, on November 1 an initial dose of 40 mg. of procaine hydrochloride was injected into the second lumbar interspace in 2 cc. of spinal fluid. The anesthetic was prompt and of the rapidly ascending type, reaching the clavicles in a period of five minutes. The maternal blood pressure dropped from 120/80 to 80/60 (fig. 2). At this moment 4 cc. of spinal fluid was withdrawn through the continuous spinal apparatus. Fifty mg. of ephedrine sulfate was administered intravenously along with a simultaneous clysis of glucose in isotonic solution of sodium chloride. The pressure promptly returned to 110/70 in eight minutes. A classic cesarean section was then performed. One placenta was on the anterior wall, and it was necessary to go through it to reach the babies. The first baby was delivered as a bilateral footling, the second also as a double footling, and the third as a vertex. These were all female babies and were enclosed in a single sac. The fourth infant was a male and was in a separate amnion with a small separate placenta (fig. 3). It was delivered as a double footling. The intravenous administration of 1 cc. of pitocin in 5 cc. of isotonic solution of sodium chloride allowed the uterus to contract well and the placentas were removed, with a measured blood loss of 300 cc. A routine closure of the uterus in three layers with continuous sutures then followed. The abdominal wall was also closed with continuous sutures in the peritoneum and fascia, and the skin was closed with clips. The maternal blood pressure remained at 120/80 throughout the operation.

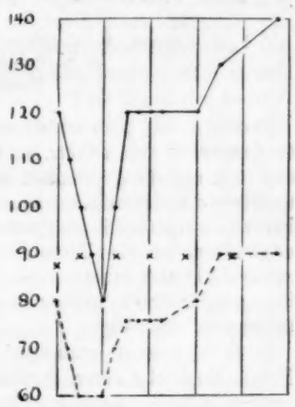

Fig. 2.—Systolic blood pressure (solid line), diastolic (broken line) and pulse (×'s). Fifteen minute spaces.

The birth weights of the babies were 3 pounds 14 ounces (1,758 Gm.), 3 pounds 9 ounces (1,616 Gm.), 3 pounds 1 ounce

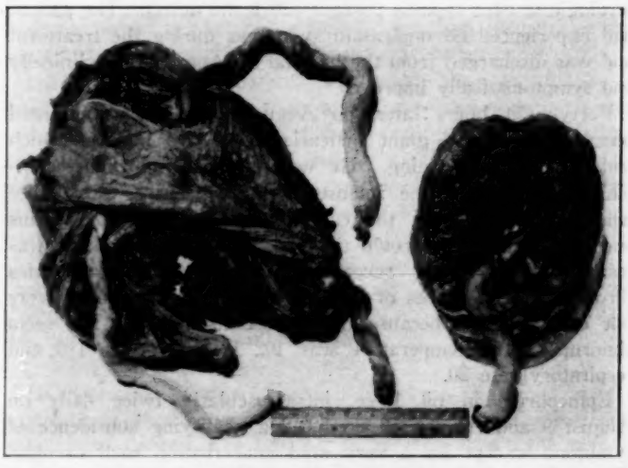

Fig. 3.—Separate amnion and placenta of male fetus and amnion and placenta of three female fetuses.

(1,389 Gm.) and 2 pounds 14 ounces (1,304 Gm.). They all breathed and cried instantly on removal from the uterus and showed good muscle vigor. They were placed in separate incubators at once and kept there for one month. Gradually the oxygen was turned off and the incubators were opened and then the babies were placed in premature hot beds. At the end of six weeks their respective weights are 4 pounds 15 ounces (2,240 Gm.), 4 pounds 14 ounces (2,211 Gm.),

4 pounds 6 ounces (1,984 Gm.) and 4 pounds (1,814 Gm.). Their feedings have consisted of breast milk from a milk bank stationed in the hospital.

COMMENT

The birth of quadruplets is reported here because of the unusual type of delivery and for the interest attached to the anesthetic employed. The safety factor of the continuous spinal anesthesia is emphasized, as shown by the prompt withdrawal of 4 cc. of spinal fluid containing some of the procaine, and the return of the maternal blood pressure to normal. In addition, the lack of narcosis or anoxemia was a vital factor in the healthy condition of the babies at birth and enabled them to breathe and cry at once without resuscitation. Likewise the anesthetic contributed in a large measure to the rapid convalescence of the mother. She was able to eat a soft diet of food a few hours after delivery and showed no nausea or postoperative abdominal distention.

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Special Articles

The following article is republished from the Epidemiological Information Bulletin *of the Health Division of the United Nations Relief and Rehabilitation Administration. It represents the best present opinion on the outlook for the development of epidemics in Europe.*—EDITOR.

THE EPIDEMIC OUTLOOK IN EUROPE

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The war in Europe is apparently drawing to a close. During the more than five years of destruction and privation accompanied by forcible or voluntary displacement of a large fraction of a populous continent's inhabitants there has been no pandemic of first magnitude. Gratifying though this is, the fact must not be taken to mean that the epidemic situation is as satisfactory as it was before the war, nor as indicating a favorable outlook for the first years of transition to stable peace. The absence of real disasters may be traced to the low endemic level of most diseases during the years preceding the war in conjunction with the advance of preventive medicine and the application on a large scale of its principles. On the other hand, caution against over optimism is dictated by the disastrous aftermath of World War I.

During the four years of World War I Europe witnessed a rise of the endemic level of infectious diseases, and there were various pestilential outbreaks, such as that of cholera in Galicia in 1915, which caused over 17,000 deaths. A devastating typhus epidemic broke out in Siberia in 1915, causing 150,000 deaths in six months, and there were severe typhus epidemics in Egypt. Moreover, typhus caused several hundred thousands of deaths in Rumania during the winter of 1917-1918. There were extensive smallpox epidemics in various countries. Nevertheless it was after the cessation of hostilities and following the disintegration of established government over wide areas that typhus, relapsing fever, cholera, smallpox, malaria, dysentery and typhoid swept across eastern Europe, leaving millions of victims, and made serious inroads also in southern and central Europe. Whether directly due to conditions of war or not, it was at the time of the armistice that the influenza pandemic struck, causing in less than half a year twenty million deaths throughout the world.

With World War II entering its final stage, civil administration is now in a fluid state in many areas and refugee movements are gathering momentum. These conditions, propitious to the propagation of epidemics, are likely to grow worse during the current year. They will further complicate the return to their native countries of millions of prisoners of war, shanghaied laborers, forcibly displaced people and other uprooted men, women and children, in themselves constituting grave potentialities as far as epidemics are concerned.

Appreciation of the problems at hand may be based on (1) the trend of epidemic diseases in recent years in areas for which fairly accurate epidemiologic data are available, (2) fragmentary information regarding the areas where no precise records of recent date exist and (3) various estimates of displaced persons. The latter problem, which has other angles than the epidemiologic, will not be dealt with in this summary.

It may be said at once that among the five pestilential diseases covered by the International Sanitary Conventions only louse borne typhus presents an immediate and grave danger to Europe. Cholera, which is a serious problem in Asia, has not appeared within recent years west of India and Afghanistan. Yellow fever seems hardly to have spread during the war and has not been observed north of the North African desert belt. It should be added however that, had no precautions been taken, the extension of these diseases would probably have been different.

As far as we know, plague has not been introduced into any European port during the war. Nevertheless this may happen at any time, as it did after World War I, because several large ports in North Africa and the Near East have become infected. The most important nearby foci are in the Suez Canal Zone and at Dakar. Although they are quiescent at present on account of the season, these foci may flare up again. Meanwhile infection has spread to other ports, such as Haifa and Jaffa in Palestine, Ferryville in Tunis, and Algiers and Oran in Algeria. The old plague centers in Morocco, especially at Casablanca, and in the Azores Islands have also shown renewed activity in recent years. The outbreak in the Suez Canal Zone from November 1943 to September 1944 was the worst on record, 712 cases being reported as against 359 in 1917. There were over 500 plague cases at Dakar in 1944, which is equal to the number notified in 1931, the worst year since 1920.

Europe has remained practically free from smallpox during the war except for the 1944 outbreak in Sicily and southern Italy and an extension of the Near East epidemic into European Turkey and the neighboring parts of Greece. The latter epidemic, which was of the classic type, has now come to an end. The Italian epidemic, the first case of which appeared in March 1944, has centered at Palermo and at Naples and vicinity. Although there have been some 1,500 cases all told, the epidemic is apparently not of prime importance because all cases have been of the mild type. Only six deaths were reported, all among debilitated children.

In this connection it may be of interest that mild type smallpox seems to have gained ground in French North Africa, while the classic type still prevails in the Near East. In the Iberian peninsula, where smallpox was widespread during the early years of the war, there are now only sporadic cases of variola minor.

The most encouraging element in the whole epidemic situation is that there were only 3 cases of smallpox in 1944 (7 cases in 1943) among the more than 200 million inhabitants of continental Europe outside the Soviet Union and the Mediterranean peninsular areas. In 1919 there were nearly 50,000 cases of smallpox in this area.

Typhus presents a far greater danger than smallpox. In certain areas severe epidemics are already under way, and in much larger areas the danger is potential because for several years there has been an insidious spread of sporadic infection throughout central Europe. It should also be remembered that North Africa and the Near East are just emerging from an epidemic wave extending from Morocco to Iran, which has been among the worst on record in several of the countries.

The Soviet Union was the principal sufferer from typhus following World War I but has apparently succeeded in keeping this disease under close control during the present war. The publication of records was discontinued, however, a couple of years before the outbreak of the war. In Poland, typhus is known to have been on the increase during the German occupation, but numerical indications are not available for the last four years.

Cases of Certain Epidemic Diseases Reported in Twelve Continental European Countries

Disease	Median, 1928-1938	Cases, 1943	1943 Incidence in Units of Prewar Level
Cerebrospinal meningitis*	2,561	7,996	3.1
Poliomyelitis	4,546	11,292	2.5
Typhoid	28,681	44,316	1.5
Dysentery**	10,965	23,110	2.1
Diphtheria	168,354	501,911	3.0
Scarlet fever	176,275	566,398	3.2

* In fifteen countries.
** In eight countries.

There are three main epidemic foci of typhus in southeastern Europe: the Rumanian with center in Bessarabia and eastern Moldavia; the Subcarpathian with center in Subcarpathian Ruthenia and extending into northeastern Hungary; the Croatian with center in Bosnia and probably extending into Serbia. All of these foci were in rapid evolution last spring, and there was a serious epidemic in Croatia and Bosnia extending late into the summer. Information for recent winter months is not available for the Subcarpathian area. An epidemic reminiscent of the World War I disaster has broken out in Rumania. Unofficial information gives 30,000 cases in Moldavia alone, and the epidemic is likely to increase up to April or May. So far, this is undoubtedly the most serious epidemic outburst of any disease during the present war.

In recent years the endemic level has been rising also in Bulgaria and Greece, and typhus was epidemic in Turkey in 1943. On the other hand, the typhus epidemic which visited Spain in 1941 and 1942, causing over 11,000 cases, has now been reduced to an endemic level. The outbreak in and around Naples during the winter of 1943-1944 (somewhat over a thousand cases all told) was brought under control in the course of a few months, and at present there is hardly any typhus in Italy.

In Germany, where typhus was formerly unknown, there were over 5,000 cases in 1943, mostly among foreign workers. The cases were spread over the entire area of the reich as far west as Rhineland. Information for recent months is not available, but present conditions obviously favor the spread of infection.

The typhus free area of the European continent now consists only of the three Scandinavian countries, Finland, Switzerland and, aside from relatively rare sporadic cases, the Netherlands, Belgium and France.

With the exception of an outbreak in Tunis in March and April 1944 and the tick borne cases in Spain, relapsing fever, which followed on the great typhus epidemics of 1919-1921, has not been heard from during the present war.

The aforementioned diseases specially dealt with in the Sanitary Conventions, namely cholera, yellow fever, plague, smallpox and typhus, are international quarantine diseases not merely because they are the most dangerous but also because they are of limited geographic extension and their introduction into uninfected areas is consequently feared. Various other epidemic diseases, such as typhoid, diphtheria, scarlet fever and influenza, are numerically more important in Europe, but they are normally endemic in all countries. International transmission thus becomes of importance only when they develop particularly virulent strains locally or attain an unusually high incidence.

Apart from the menace of typhus, the most significant fact of the epidemic situation is that the incidence of all the common infectious diseases has doubled or trebled in that part of the European continent for which statistics are available, and this means chiefly among the resident population of the less desperately afflicted countries. The accompanying table, which covers mainly central, northern and western Europe, is based on the regular official returns of twelve countries where the public health services have never ceased to function and where the statistics may be considered reasonably accurate. Returns for 1943 have been used because the 1944 data are not yet complete. The prewar data used for comparison cover a period sufficient to include unfavorable years.

The significant fact brought out by the table is that there has been a heavy increase in the incidence of not merely some but of all these diseases. It is unusual that entirely unrelated diseases should reach a peak during the same year and on a whole continent. The increase has probably been even greater than shown because reporting is likely to have deteriorated in most countries, fewer physicians being available to notify civilian cases than in peacetime. Furthermore, there are excluded from the statistics the huge number of men in the armed forces and, in several countries, also certain categories of nonresident population. There is thus a greatly increased amount of infection of all kinds, which doubtless results also in an increased ratio of carriers. It is in this polluted atmosphere that the war will have to be wound up.

Efforts to control typhoid have been partly successful, and the increase of this disease has been the least spectacular among those shown in the table. However, the table does not include Italy, which in 1942 was responsible for one half of the typhoid cases reported in all of Europe outside the Soviet Union and the Iberian peninsula. The rate of increase is further lowered by the returns for Hungary, where the prewar level has been maintained by systematic vaccination. In other central European countries the incidence of typhoid has doubled, and in France it has almost trebled.

Typhoid remains as rare in the Scandinavian countries as in the United Kingdom; in a general way its incidence increases from north to south. While in Denmark and Sweden there was less than 1 case per hundred thousand inhabitants in 1943, there were 6 in the Netherlands, 10 in the prewar Germany, 27 in Bohemia-Moravia, 36 in France (highest in the south), over 200 in Spain and probably not less in Italy, and 133 in Greece, with only a fraction of the actual cases reported. Switzerland remained an area of low incidence. The problem of typhoid will naturally become more acute in areas where actual fighting has caused destruction of water supplies and the herding of refugees.

Paratyphoid fevers, on the other hand, are at least relatively more prevalent in the northern part of Europe, where cases are from two to five times more numerous than typhoid cases. In prewar Germany the score is about even. In southern Europe, on the other hand, paratyphoid cases are only a small fraction of the total enteric fever group.

Dysentery is perhaps to be feared even more than typhoid fever during the immediate postwar period. The figures for this disease in the table represent only the cases actually reported in greater Germany, Bohemia-Moravia, Hungary, Switzerland, the Netherlands and the three Scandinavian countries, and reporting of this group of diseases is everywhere defective. The fourteenfold increase of dysentery cases over the prewar level which took place in the Netherlands suggests that only a fraction of the cases occurring elsewhere in central Europe have been notified. Fortunately the type most commonly encountered among the resident civilian population is the mild Sonne E. In the German army, however, Flexner and Hiss Y have prevailed, and there have been outbreaks of the Shiga type among prisoners of war. Their return from central Europe may therefore give rise to epidemics of severe types, especially should such return occur in the autumn. The spread of winter dysentery for some years past in the North Sea and Scandinavian areas is a new development the significance of which is not yet clear. Amebic dysentery seems nowhere to have attained epidemic proportions and is unimportant in northern and central Europe.

The "new" disease of this war has been epidemic jaundice (infectious hepatitis). From an obscure existence among the garrison of Malta and in a few German army units, it assumed proportions to interfere occasionally with military operations and spread among the civilian population from the Libyan desert to the North Cape. The disease was really not new but was known already from World War I, when at times it was confused with Weil's disease. It occurred also among civilians in various countries but had never been considered capable of setting up veritable epidemics. The reported incidence has for each of the last two years been as high as 1 per cent of the civilian population in Norway and 4 per cent in some of the provinces. Even higher rates of incidence have been reported in certain military units in North Africa. It appears to have been widespread in Germany, but, if it has been made notifiable, the number of cases has remained a secret. Epidemic jaundice is notifiable only in the three Scandinavian countries, Finland and Switzerland. About 65,000 cases were reported in these five countries in 1943, and returns for 1944 are, on the whole, not lower. The case mortality rate has fortunately, at least hitherto, been fairly low, usually ranging from 1 per thousand to 1 per cent, but there is some evidence that it increases with age. Epidemic jaundice is clearly a virus disease of an extremely high degree of infectivity and capacity for covering distances, which may have to do with the long period of incubation (three or four weeks). Since its potentialities are unknown and means of combating it have not so far been devised, this disease deserves to be closely watched.

Among other diseases of Mediterranean origin pappataci or sandfly fever has given some trouble in the Balkans and in Italy. Undulant fever, whether of the Mediterranean or the Bang type, does not seem to have increased to any noteworthy extent during the war.

During the twenty years between the two world wars poliomyelitis has slowly spread from north to south in Europe, moving by patches of varying intensity. During the war years this spread has apparently become accelerated. The incidence is considerably higher on the continent than in the British Isles. The most important poliomyelitis epidemics of 1943 occurred in Sweden, the Netherlands and central France. In 1944 Denmark, Sweden and Switzerland were the principal sufferers, and in the two former countries the outbreaks reached their peaks only in November.

As might be expected, cerebrospinal meningitis has been much above its normal level ever since the beginning of the concentration of troops leading up to the war. Since 1941, however, there has been a gradual decrease of the incidence, which, with minor exceptions, has constantly remained lower on the continent than in the British Isles.

Encephalitis lethargica has not been heard from, except for the usual sporadic cases.

So far diphtheria has turned out to be the leading epidemic disease of the war on the European continent as a cause both of morbidity and of mortality. It is estimated that there were at least one million cases in 1943 outside of the Soviet Union, and the case mortality rate can at present not be set at less than 5 per cent. In Germany alone nearly 300,000 cases were reported in 1943, with the rise continuing also in 1944, and there were 15,000 deaths from diphtheria in 1942. The incidence of carriers has increased enormously. The rise of diphtheria in Germany has been steady over a number of years, while in several other countries, and especially in Norway and the Netherlands, it has been explosive, attaining in 1943 respectively twenty-four and fourteen times the normal level. During the last three years there have been about 150,000 cases of diphtheria in the Netherlands. With a case mortality rate in that country of nearly 7 per cent, diphtheria has thus become one of the leading causes of death, running not very much behind tuberculosis in spite of the rapid increase of the latter disease. A severe epidemic is prevailing also in Finland. The contrast with the experience in England, where diphtheria has actually been reduced during the war years, is most striking. On the continent a reduction has been attained —through vaccination—only in Hungary. Denmark, Sweden and Switzerland have also maintained a relatively low incidence.

The most serious development of diphtheria, however, is not so much its spread as the change in type and its increasing gravity. The proportion of severe croupous cases has increased, and particularly noteworthy is the increase of cases refractory even to early serum treatment. In a series of diphtheria autopsies

performed in Germany 64 per cent showed interstitial myocarditis, while this condition had formerly been found in only one fourth of the postmortems. There has also been a shifting of the age incidence. At Rostock, in 1943, 30 per cent of the diphtheria deaths were over 15 years of age (6 per cent before 1940) and 9 per cent over 60. Diphtheria has been among the most important causes of fatal illness in the German army, and it has also proved a fatal complication of typhus as well as of chest wounds.

Scarlet fever has spread almost as much as diphtheria and with few exceptions its incidence is from two to five times the prewar level. Nevertheless there has been no explosive epidemic comparable to the diphtheria outbreaks in the Netherlands and in Norway. There seems to have been no change in type or gravity of the disease. A heavy increase of measles has also been noted, especially during the earlier years of the war.

The only important epidemic disease which seems to have remained unaffected by the war is influenza. The usual winter waves have come and passed, the most recent reaching its peak during the early part of the winter 1943-1944. In spite of abnormal living conditions, none of them attained the gravity of the three or four most serious interwar epidemics. The change from influenza B to influenza A reported to have taken place in England between the 1942-1943 outbreak and that of 1943-1944 does not seem to have had any visible effect on the mortality. Nevertheless the danger of major epidemics cannot be entirely disregarded.

In addition to the epidemic perils, the increasing incidence of endemic diseases, such as malaria, syphilis and tuberculosis, must be carefully considered. Malaria is the leading cause of morbidity in a large part of the Mediterranean basin, and it is reported to have assumed epidemic proportions in Greece during the last couple of years. The areas of high endemicity in the Balkans and in Italy have probably by this time returned to their lamentable precontrol state, and further spread must be counted on, especially in view of the forced migrations. Falciparum infection predominates in autumn in the truly Mediterranean countries, while farther north vivax malaria prevails. The latter form may extend northward into Europe as it did after the last war.

Reports relating to the Scandinavian countries, Finland, France and Germany indicate that the incidence of syphilis has increased from three to nine fold, and the achievements of the twenty years of peace in venereal disease control have practically been wiped out. While the spread of gonorrhea was checked for some years by successful sulfonamide treatments, virulent sulfonamide resistant strains are now reported to be developing and spreading. Penicillin treatment has not yet become generalized.

Infectious skin diseases, such as scabies, have also spread at an extraordinary rate, but the removal of soap from the list of luxuries should bring about a downward trend.

The war had no effect on the tuberculosis mortality in 1939 and 1940, but an increase began in 1941 in several countries and became more or less general from 1942 and on. The situation is now much the same as during and immediately after World War I, except that the increase this time started from a lower level. The part of the improvement gained from 1920 to 1939 which has been lost varies greatly. Great Britain, the Scandinavian countries and Switzerland have withstood the years of trial remarkably well, although their tuberculosis problems may require increased attention during the first postwar years. The number of tuberculosis cases has increased greatly in France, Belgium, the Netherlands, Germany, Austria, Czechoslovakia and Hungary, and it has doubled in many parts of this area. Among these countries the Netherlands is undoubtedly the worst sufferer. The Balkans, where the tuberculosis mortality was high also before the war, are probably back to the conditions of twenty-five years ago. In Italy the situation is likely to become worse than ever before, and Poland faces an unprecedented calamity.

In general, the epidemic outlook is not unlike the forecast which might have been made this day twenty-seven years ago. As then, the general endemic level of nearly every kind of infection has risen and serious epidemics have already appeared. In February 1918 no one could have forecast the influenza pandemic, but other developments might have been foreseen had sufficient information been currently available. Unpredictable epidemics may occur, war or no war, but our knowledge of the existing situation is far more complete and up to date than then. In several ways the outlook is darker than in 1918 because destruction of buildings and displacement of persons are far more widespread than during World War I. On the other hand, the endemic level was lower to start with in 1939 than it was in 1914, and the world is now better equipped to deal with many of the important infectious diseases.

On the public health front World War I lasted not four but more nearly ten years. However, it was gloriously won. Many years of effort in combating infectious diseases have once more been lost as far as Europe is concerned. To make up for backsliding will take several years after the cessation of active hostilities, but the public health profession and services can win their war now as then.

The foregoing summary, although cursory for reasons of space, is based entirely on reliable official information, and no representations by unqualified informers having an interest in magnifying the plight of their countries have been taken into account. Reviews dealing in greater detail with each disease will appear in subsequent numbers, as will also the statistics relating to these diseases. One of the tasks of this bulletin is to make accessible in one place the records gathered in different parts of the world and by various national and international services. Beginning to appear in the next number, these statistics will be gradually developed so as to cover in the end all infectious diseases of interest. The reviews will be informal and unrelated to any action under the International Sanitary Conventions, as they are prepared solely for the convenience of health officers and others concerned with the rise and fall of infectious disease.

In 1918, beyond the notification of plague, cholera and yellow fever, there was no international clearing house for epidemiologic information and no publication giving current records of epidemic diseases. This task was taken up by the Epidemiological Intelligence Service of the League of Nations only in 1922, that is, after the postwar epidemics had passed their peaks. Epidemiologists realized already then that such a service would have been still more helpful had it been established early in that war. It is the hope of the UNRRA Health Division that this new venture, which will reach its full development only in the course of some months, will complete and coordinate existing undertakings in this field.

THE SURGICAL TREATMENT OF MALFORMATIONS OF THE HEART

IN WHICH THERE IS PULMONARY STENOSIS OR PULMONARY ATRESIA

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Heretofore there has been no satisfactory treatment for pulmonary stenosis and pulmonary atresia. A "blue" baby with a malformed heart was considered beyond the reach of surgical aid. During the past three months we have operated on 3 children with severe degrees of pulmonary stenosis and each of the patients appears to be greatly benefited. In the second and third cases, in which there was deep persistent cyanosis, the cyanosis has greatly diminished or has disappeared and the general condition of the patients is proportionally improved. The results are sufficiently encouraging to warrant an early report.

The operation here reported and the studies leading thereto were undertaken with the conviction that even though the structure of the heart was grossly abnormal, in many instances it might be possible to alter the course of the circulation in such a manner as to lessen the cyanosis and the resultant disability. It is important to emphasize the fact that it is not the cyanosis, per se, which does harm. Nevertheless, since cyanosis is a striking manifestation of the underlying anoxemia and the compensatory polycythemia, a brief discussion of the causes of cyanosis and the factors operative in congenital malformations of the heart is essential in order to understand the principles underlying the present operation.

Cyanosis is due to the presence of reduced hemoglobin in the circulating blood. It is a well established fact that there must be at least 5 Gm. of reduced hemoglobin per hundred cubic centimeters of circulating blood for cyanosis to become apparent. It has long been recognized that one of the principal factors in the production of cyanosis in malformations of the heart is the direct shunting of venous blood into the systemic circulation. Lundsgaard and Van Slyke [1] in their classic studies on the causes of cyanosis showed that there were four important factors in the production of cyanosis: the height of the hemoglobin, the volume of the venous blood shunted into the systemic circulation, the rate of utilization of oxygen by the peripheral tissues and the extent of the aeration of the blood in the lungs. Their studies demonstrated the great importance of pulmonary factors. The extent of the oxygenation of the blood in the lungs clearly depends on the vital capacity of the individual, the rate of the flow of blood through the lungs, the partial pressure of the oxygen in the inspired air and also on specific pulmonary factors, which these authors designated as the a factor. These investigators showed that in most, if not in all, cases in which there was a pronounced polycythemia, secondary changes occurred in the lungs of such a nature that all of the blood that passed through the lungs was no longer in effective contact with the oxygen in the alveoli. The importance of this factor can be demonstrated by the prolonged inhalation of oxygen. In almost every case in which there is polycythemia, cyanosis can be greatly lessened by the prolonged inhalation of oxygen. The fact that all of the blood which circulated through the lungs is not fully oxygenated made it seem improbable that if more blood circulated through the lungs a larger proportion of the blood would be oxygenated. Thus the demonstration of the a factor completely overshadowed another vitally important factor, namely the volume of blood which reaches the lungs for aeration.[1a]

Expressed in the simplest terms, the circulation of the blood through the lungs after birth is essential for life; any one deprived of such circulation dies. Indeed there is a point at which, even though none of the other pulmonary factors are operative in the production of cyanosis and all of the blood that passes through the lungs is fully oxygenated, the volume of blood that reaches the lungs for aeration and hence the volume of oxygenated blood returned to the systemic circulation is insufficient for the maintenance of life. For example, in all cases of pulmonary atresia in which the circulation to the lungs is by way of the ductus arteriosus the closure of the ductus arteriosus renders the condition incompatible with life.

Undoubtedly the importance of the diminution of flow of blood to the lungs has not been fully appreciated, mainly because studies on the nature of cyanosis have been made on older children and young adults, and it is only when this factor is not of vital importance that the individual has survived to that age. All infants with pulmonary atresia with or without a right ventricle and with or without dextroposition of the aorta, in whom the closure of the ductus arteriosus cuts off the circulation to the lungs, die at an early age. In cases of complete pulmonary atresia death occurs before the complete cessation of circulation of blood through the lungs; hence in such cases there is always slight patency of the ductus arteriosus. In cases of a tetralogy of Fallot with an extreme pulmonary stenosis, the ductus arteriosus may become entirely obliterated before death.

There are two different types of congenital malformations which illustrate the importance of the volume of the pulmonary circulation in the production of cyanosis. The first is that of a single ventricle with a rudimentary outlet chamber in which it is common to find that one great vessel is given off from the common ventricle and one from the rudimentary outlet chamber. Usually the vessel which arises from the common ventricle is of normal size and that from the rudimentary outlet chamber is diminutive in size.[2] If the great vessels occupy their normal positions, the aorta arises from the common ventricle and is of large caliber, whereas the pulmonary artery which arises from the rudimentary outlet chamber is of small caliber. Under such circumstances a large volume of blood goes to the systemic circulation and only a small volume of blood goes to the lungs. Consequently a large volume of unoxygenated blood is mixed with a small volume of oxygenated blood and cyanosis is intense.[3] When, however, the great vessels are transposed and the pulmonary artery is large and the aorta is small, a large volume of blood goes to the lungs for aeration. Under these circumstances a large

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1. Lundsgaard, C., and Van Slyke, D. D.: Cyanosis, Medical Monographs, vol. 2, Baltimore, Williams and Wilkins Company, 1923.

1a. The relative importance of this factor and of the a factor will be discussed in a forthcoming paper by Taussig and Blalock.

2. Taussig, H. B.: Clinical Analysis of Congenital Malformations of the Heart, to be published by the Commonwealth Fund, New York.

3. Taussig, H. B.: A Single Ventricle with a Diminutive Outlet Chamber, J. Tech. Meth. & Bull. I. A. M. M. **19**: 120-127, 1939.

volume of oxygenated blood is mixed with a relatively small volume of venous blood and cyanosis is minimal or absent, as in the case reported by Glendy and White.[4]

The same phenomenon is also seen in cases of truncus arteriosus. When the pulmonary arteries are given off directly from the aorta there is adequate circulation to the lungs, and cyanosis is minimal or absent. In contrast to this, if the pulmonary artery fails to arise from the heart or connect with the aorta and the circulation to the lungs is by way of the bronchial arteries only a small volume of blood reaches the lungs for aeration, and cyanosis is intense.[5]

The importance of adequate circulation to the lungs is further illustrated in the anomalies of the venous return in which all of the pulmonary veins drain into the right auricle; consequently within this chamber there is complete admixture of venous and arterial blood. In such cases a large volume of blood goes to the lungs for aeration and a large volume of oxygenated blood is returned to the right auricle. There is great right-sided cardiac enlargement but no cyanosis until the terminal collapse of the circulation.[6]

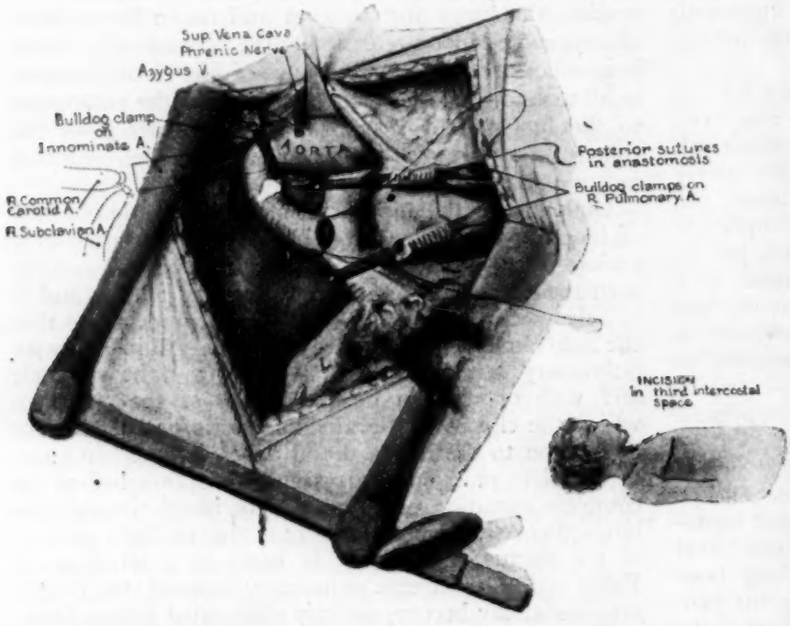


Fig. 1.—General exposure of the operative field on the right side. The end of the innominate artery is being anastomosed to the side of the right pulmonary artery. The posterior row of sutures is complete. The anterior row has not been inserted.

These observations clearly indicate that many gross malformations of the heart are compatible with life provided there is adequate circulation to the lungs, and furthermore that lack of circulation to the lungs is the primary cause of death in many infants with congenital malformations of the heart. Furthermore, one of us (H. B. T.) has seen several infants with pulmonary stenosis in whom cyanosis was not apparent until the ductus arteriosus closed. In other words, there was no "visible" cyanosis while the circulation to the lungs was adequate. It was an appreciation of these facts (H. B. T.), together with an extensive previous experience with the experimental use of large arteries for the purpose of conducting blood to sites not usually supplied by such vessels, that led to the development of the clinical work recorded in this paper.

The feasibility of anastomosing a systemic artery to one of the pulmonary arteries in experimental animals has been demonstrated by Levy and Blalock.[7] As far as we are aware, this was the first time that both the course and the function of a large artery were altered. Similar experimental alterations were produced subsequently by Eppinger, Burwell and Gross[8] and by Leeds.[9] Blalock and Park[10] have reported the suturing of the severed proximal end of the subclavian artery to the aorta as a means for conducting blood beyond the point of an experimental coarctation of the aorta. In unreported observations by Kieffer and Blalock the divided proximal end of the splenic artery has been connected to the distal end of the divided left renal artery and there has been no evidence of renal failure even though the right kidney was removed. In other words, arterial anastomoses have been performed in animals for the purpose of conducting blood to sites other than those ordinarily supplied by these vessels.

Before undertaking the operations on patients, many experiments were performed in an effort to produce pulmonic stenosis in dogs. This work met with little success. Finally, in an effort to cause a significant decrease in the oxygen saturation of arterial blood, one or more lobes of the lungs were removed from each side of the chest, and the main arteries and veins of these lobes were connected end to end by suture. In other words, bilateral pulmonary arteriovenous fistulas were produced. These procedures resulted in some instances in a pronounced reduction in the oxygen saturation of the arterial blood. As the result of an artificial patent ductus arteriosus made in two such experiments, there was a significant increase in the arterial oxygen saturation. Although this experimentally produced condition is quite different from that seen in patients, it is of interest that the making of an anastomosis between systemic and pulmonary arteries caused an increase in the oxygen saturation of the arterial blood despite the fact that several lobes of the lungs had been removed.

Since the present operation was devised to compensate for an inadequate flow of blood to the lungs, it seemed desirable that the anastomosis be made in such a manner that the blood from the systemic artery would be able to reach both lungs. It is obvious that the suture anastomosis could not be made to the main pulmonary artery since occlusion of this vessel for more than a few minutes causes death. It appeared, therefore, that the anastomosis should be made just distal to the division of the main pulmonary artery and, furthermore, that the side of the chosen vessel should be used in order that the blood might flow to both lungs.

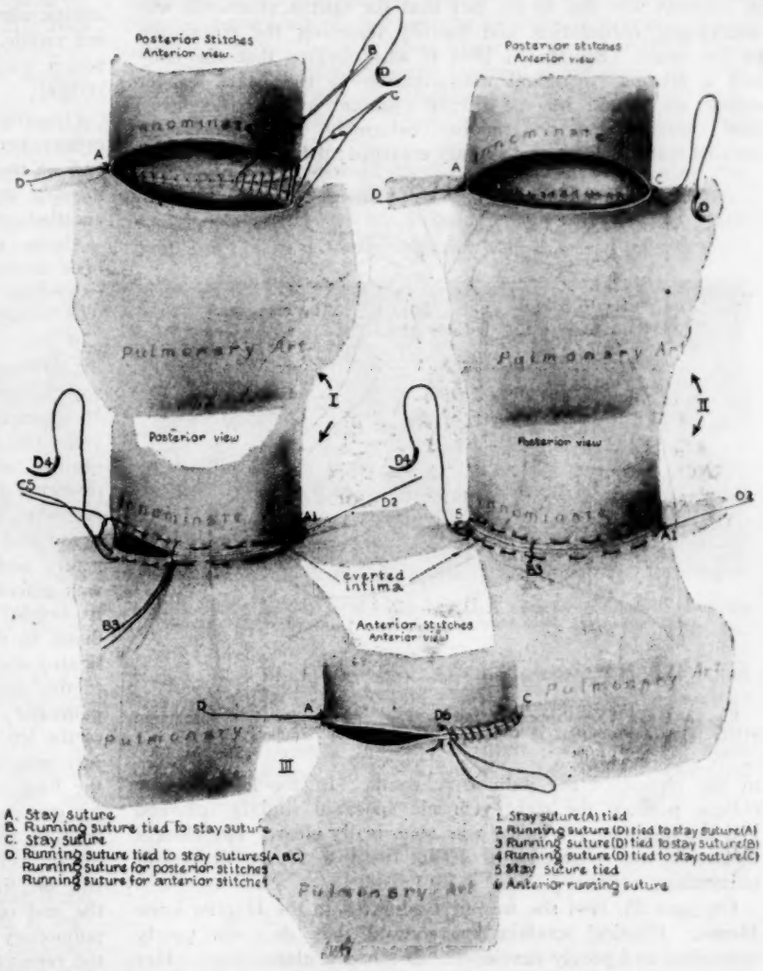
It was our original idea that the subclavian artery would be the ideal systemic vessel and that after division

4. Glendy, Margaret M.; Glendy, R. E., and White, P. D.: Cor Biatriatum Triloculare, Am. Heart J. **28**: 395-401, 1944.
5. Taussig, H. B.: Clinical Findings in Cases of Truncus Arteriosus, to be published.
6. Taussig, H. B.: Clinical and Pathological Findings in the Anomaly of Venous Return in Which All of the Pulmonary Veins Drain into the Right Auricle, to be published.
7. Levy, S. E., and Blalock, A.: Experimental Observations on the Effects of Connecting by Suture the Left Main Pulmonary Artery to the Systemic Circulation, J. Thoracic Surg. **8**: 525-530, 1939.
8. Eppinger, Eugene C.; Burwell, C. Sidney, and Gross, Robert E.: The Effects of the Patent Ductus Arteriosus on the Circulation, J. Clin. Investigation **20**: 127-143 (March) 1941.
9. Leeds, S. E.: The Effects of Occlusion of Experimental Chronic Patent Ductus Arteriosus on the Cardiac Output, Pulse and Blood Pressure of Dogs, Am. J. Physiol. **139**: 451-459 (July) 1943.
10. Blalock, A., and Park, E. A.: The Surgical Treatment of Experimental Coarctation (Atresia) of the Aorta, Ann. Surg. **119**: 445-456 (March) 1944.

of this artery its proximal end should be anastomosed to the side of the left pulmonary artery. The fortunate experience to be reported in regard to the second patient has led us to prefer the use of the innominate artery in patients with a severe degree of anoxemia. This patient had a right aortic arch, and the innominate artery was directed to the left side of the chest and neck.

Although there were slight variations in each of the operations, the major features were as follows: Light general anesthesia was produced by the inhalation of ether or cyclopropane. The patient was placed on the table on his back with a slight elevation of that side of the chest which was to be exposed. The patient's arms were strapped in place along his sides. The operation was performed on the right or left side depending on the position of the great vessels and the artery to be used in the anastomosis. The incision was made in the third interspace and extended from the lateral border of the sternum to the axillary line. The pleural cavity was entered and the third and fourth costal cartilages were divided. A rib spreader was introduced and a good exposure of the upper half of the pleural cavity was obtained. This area is shown in figure 1. The right or left pulmonary artery was then exposed and the vessel was dissected from the adjacent tissues for as great a distance as possible. This was more difficult on the right side than on the left and it was necessary to ligate and divide the azygos vein and to retract the superior vena cava medially. Nothing further was done to the pulmonary artery at this time. Attention was then focused on the systemic artery which was to be anastomosed to one of the pulmonary arteries. The subclavian or innominate artery was dissected free of the adjacent tissues and the vessel chosen was occluded temporarily at the point where it arose from the aorta by the use of a bulldog arterial clamp. In cases in which the innominate artery was chosen, its branches (subclavian and common carotid) were ligated at their origins and the innominate artery was cut across just proximal to the ligatures. In the 1 case in which the left subclavian artery was used for the anastomosis to the pulmonary circulation it was necessary to divide the thyrocervical trunk, the vertebral artery and the internal mammary artery in order to gain access to a sufficient length of the vessel. After the removal of some of the adventitia from the systemic vessel the pulmonary artery was further prepared for the anastomosis. A bulldog arterial clamp was placed on the left or right pulmonary artery just distal to the point of division of the main pulmonary artery. A second bulldog arterial clamp was placed on the left or right pulmonary artery just proximal to the point where the vessel gave off a branch to the upper lobe of the lung. A transverse opening was made into the side of the pulmonary artery approximately midway between these two arterial clamps. This opening was of about the same diameter as that of the end of the systemic vessel which was to be anastomosed to it. It must be emphasized that the pulmonary artery was not occluded until all preparations for the anastomotic procedure had been made.

The anastomosis between the end of the systemic artery and the side of the pulmonary artery was carried out in the following manner: Fine silk on a curved needle was used as suture material. Before placing the posterior row of sutures, a stay suture was placed at one end. This was followed by the insertion of a running suture, which was not drawn taut until the greater part of the posterior row had been placed. The stay suture was then tied and the running suture was in turn tied to the stay suture. The posterior row was completed and was tied to another stay suture. The anterior row consisted of a simple through and through


Posterior Stitches
Anterior view
Posterior stitches
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everted intima
Anterior Stitches
Anterior view
A. Stay suture
B. Running suture tied to stay suture
C. Stay suture
D. Running suture tied to stay sutures(A B C)
Running suture for posterior stitches
Running suture for anterior stitches
1. Stay suture(A) tied
2 Running suture(D) tied to stay suture(A)
3 Running suture(D) tied to stay suture(B)
4 Running suture(D) tied to stay suture(C)
5 Stay suture tied
6 Anterior running suture

Fig. 2.—Details of the method by which the end of a systemic artery is anastomosed to the side of one of the pulmonary arteries.

continuous suture which approximated intima to intima. The anastomosis is shown diagrammatically in figure 2. The bulldog clamps were then removed from the pulmonary artery, and this was followed by removal of the clamp from the systemic vessel. If bleeding from the suture line did not cease spontaneously, it was stopped by the use of additional sutures. The lung was reexpanded and the incision in the chest wall was closed. Two encircling sutures of braided silk were used for approximating the third and fourth ribs. The soft tissues of the chest wall were closed in multiple layers with interrupted silk sutures.

There follows a detailed report of the 3 cases in which such an operation has been performed.

REPORT OF CASES

CASE 1.[11]—*History.*—E. M. S., a girl, was born prematurely in the obstetric service of the Johns Hopkins Hospital on Aug. 3, 1943. Her birth weight was 1,105 Gm. A systolic murmur was noted shortly after birth. Slight cyanosis was noted on the fourth and fifth days of life; this subsequently disappeared. The baby gained weight slowly and was finally discharged at 4 months of age weighing 2,900 Gm. After discharge the baby was followed in the dispensary. She was at first thought to have a simple interventricular septal defect, because the heart was normal in size and there was no cyanosis.

At 8 months of age the baby had her first attack of cyanosis, which occurred after eating. It was then for the first time that we thought she had a tetralogy of Fallot and not a simple interventricular septal defect. It soon became evident that cyanosis was increasing. It seemed probable that this increase in cyanosis was due to the fact that the ductus arteriosus was undergoing obliteration and thereby lessening the circulation to the lungs. By March 1944 it was obvious that the baby had a serious congenital malformation of the heart. After eating she would become deeply cyanotic, roll up her eyes, lose consciousness and appear extremely ill. Fluoroscopy showed that the heart was slightly enlarged; there was no fulness

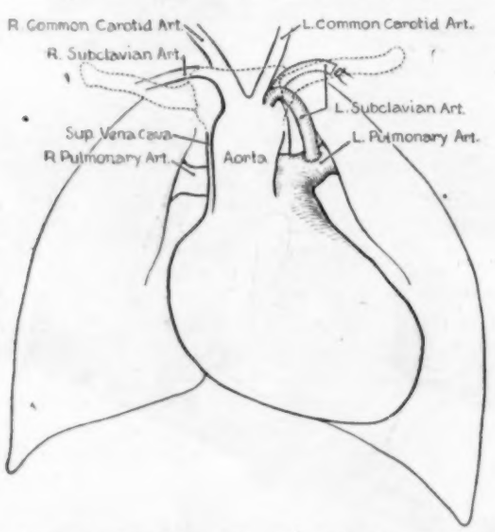

Fig. 3 (case 1).—Procedure used. The end of the left subclavian artery was anastomosed to the side of the left pulmonary artery.

in the region of the pulmonary conus. In the left anterior oblique position the right ventricle appeared slightly enlarged and the pulmonary window was abnormally clear. The clinical diagnosis was tetralogy of Fallot with a severe degree of pulmonary stenosis.

On June 25, 1944 she was first admitted to the Harriet Lane Home. Physical examination showed that she was poorly nourished and poorly developed. She had a glassy stare. Her lips were cyanotic. The heart was slightly enlarged and there was a harsh systolic murmur best heard along the left sternal border. The liver was at the costal margin. The baby was given oxygen and phenobarbital but remained very irritable and would become intensely cyanotic when taken out of the oxygen tent. During her three weeks' stay in the hospital she gained 200 Gm. and weighed 4.66 Kg. on discharge. She was sent home because it was felt that her condition was hopeless.

She was followed in the cardiac clinic for three months, during which time she showed increasing cyanosis and failed to gain weight. She was readmitted on October 17 because of increasing spells of cyanosis, coma and great venous distention of the head and body.

The weight on admission was 4.6 Kg. The venous distention was so great that the possibility of a subdural hydroma or hematoma was considered. Subdural tap was performed, with the removal of 8 cc. of clear fluid from the right side and a small amount of bloody fluid from the left.

The size of the heart as seen in the anteroposterior view was essentially the same as noted previously. There was still a harsh systolic murmur. In the left anterior oblique position the contour of the heart appeared as a little round ball with a narrow aorta and a clear pulmonary window (fig. 4); this, we believe, is characteristic of a very severe tetralogy of Fallot with a functional pulmonary atresia, that is, a pulmonary stenosis which is so extreme that the condition is not long compatible with life.[2] It was questioned at that time whether in addition to the malformation of the heart she suffered from mental retardation.

During the next six weeks she refused most of her feedings; she lost weight and just before operation weighed only 4 Kg. The red blood cell count, which had been 7,000,000 on admission, had fallen to 5,000,000. Cyanosis was proportionally less conspicuous; indeed, at times while lying quietly, cyanosis was not visible. The clinical diagnosis was again tetralogy of Fallot which was so severe that the baby's condition was becoming critical.

Operation.—This was performed on November 29. The procedure consisted in the anastomosis of the divided proximal end of the left subclavian artery to the side of the left pulmonary artery, as shown diagrammatically in figure 3. The anesthetic agent was administered by Dr. Merel Harmel.

Under ether and oxygen anesthesia, administered by the open method, an incision was made on the left side of the chest extending from the edge of the sternum to the axillary line. The pleural cavity was entered through the third interspace. The left lung appeared normal. No thrill was felt on palpating the heart and pulmonary artery. The left pulmonary artery was identified and was dissected free of the neighboring tissues. It appeared to be of normal size. The superior pulmonary vein, on the other hand, seemed considerably smaller than normal. The left subclavian artery was identified and was dissected free of the neighboring tissues. In order to secure access to a sufficient length of this vessel it was necessary to ligate and divide the vertebral artery, the internal mammary artery and the thyrocervical axis. A bulldog arterial clamp was placed on the subclavian artery at a point just distal to its origin from the aorta. The subclavian artery was ligated distal to the point at which the thyrocervical trunk had been ligated and divided, and the vessel was cut across just proximal to this ligature. Two bulldog clamps were placed on the left pulmonary artery, the first clamp being placed at the origin of the left pulmonary artery and the second clamp being placed just proximal to the point where the pulmonary artery entered the lung. There was ample space between these two clamps for our purpose. A small transverse incision was made in the wall of the pulmonary artery at a point approximately equidistant between the two clamps. By the use of china beaded silk on fine needles an anastomosis was performed between the end of the left subclavian artery and the side of the left pulmonary artery. There was practically no bleeding following the removal of the clamps.

From a technical point of view the anastomosis seemed to be satisfactory. The main cause for concern was the small size of the left subclavian artery. It was somewhat disturbing that one could not feel a thrill in the pulmonary artery. We were confident, however, that the anastomosis was patent. A small quantity of sulfanilamide was placed in the left pleural cavity and the incision in the chest wall was closed. The patient was given 200 cc. of isotonic solution of sodium chloride and 50 cc. of blood during the operative procedure. The operation required slightly less than an hour and a half and the left pulmonary artery was occluded for approximately thirty minutes. The patient's condition at the end of the operation seemed moderately good.

Postoperative Course.—This was stormy. The patient's left arm and hand were observed frequently. The radial pulse was not palpable and this extremity was cooler than the opposite one, but it was apparent that the circulation was adequate to maintain life of the part. The child suffered from repeated bilateral pneumothoraces, and frequent aspirations were required.

11. This case was discussed briefly at the meeting of the Southern Surgical Association, Dec. 5, 1944, in a paper by Dr. Arthur Blakemore.

Probably the pneumothorax on the right was due to the use of too great pressure in the reexpansion of the left lung at the completion of the operative procedure. As it was found to be a positive pressure pneumothorax, constant suction was exerted through a needle inserted into the right pleural cavity. Had it not been for the excellent care given by the pediatric house staff, particularly Dr. Kaye, Dr. Whitemore, Dr. Steinheimer, Dr. Hammond, Dr. Gilger and Dr. Helfrick, in all probability the child's life would not have been saved.

The child's condition began to improve two weeks after operation. Thereafter further aspirations of the pleural cavity were not required. The occasions on which the patient would become cyanotic became less frequent. Otitis media developed and responded to treatment. The systolic murmur became somewhat louder, but a continuous murmur could not be heard in the pulmonary area.

The patient was discharged from the hospital on Jan. 25, 1945, almost two months after the day of operation. Her condition was considerably better than it had been before operation. More recent follow-up studies have shown that she is gaining weight and that she is only occasionally cyanotic. If the cyanosis increases, it may be necessary to perform a similar operation on the opposite side. Roentgenograms of the patient's heart both before and after operation are shown in figure 4.

It is unfortunate that we do not have a quantitative degree of improvement such as might have been afforded by determinations of the oxygen saturation of the arterial blood. In view of the small size of the child we did not feel warranted in doing arterial punctures. The clinical improvement, however, has been striking. The baby takes her feedings well, is alert and active and has gained a kilogram in weight (that is, 25 per cent of her former body weight).

CASE 2.—*History.*—B. R., a white girl born July 9, 1933, was first seen at the Harriet Lane Home at 9 years of age, referred by Dr. Dexter Levy of Buffalo. The patient was cyanotic at birth. The birth weight was 6½ pounds (2,955 Gm.). She was breast fed for six months. In infancy she gained extremely slowly. She had erysipelas at 1½ years of age, a septic sore throat at 4½ years of age, chickenpox at 7 years, measles at 8 years and mumps at 9 years.

The patient was first seen in the Harriet Lane Home on Feb. 13, 1943. She was intensely cyanotic, became dyspneic on slight exertion and would constantly squat to get her breath. There was intense cyanosis and clubbing of the fingers and the toes. The buccal mucous membranes were of a deep mulberry color. There was suffusion of the conjunctiva. The chest was barrel shaped. Her heart was within normal limits in size. There was no thrill over the precordium. On auscultation there was a harsh systolic murmur which was maximal low down in the third and fourth interspaces. The murmur was much louder in the recumbent position than in the erect position, and louder when she bent forward than when she tried to sit erect. The murmur was not widely transmitted and was not audible in the back. The second sound at the base was pure. The lungs were clear. The liver was at the costal margin and the spleen was not palpable. The femoral arteries were readily palpable. The extremities, as previously mentioned, showed intense cyanosis and pronounced clubbing. At this time she climbed half a flight of stairs and walked, almost ran, leaning forward, 60 feet to her room, and then fell forward on the bed and lay in a knee-chest position, panting heavily and without speaking for half an hour.

The red blood cell count was 8,700,000; the hemoglobin was 25 Gm.; the hematocrit reading was 78.

The electrocardiogram showed a normal sinus mechanism, PR interval of 0.16 second, normal upright T waves in all four leads, and considerable right axis deviation.

X-ray examination and fluoroscopy showed the heart to be of normal size with a concave curve at the base to the left of the sternum (fig. 6). To the right of the sternum the superior vena cava cast a wide ribbon-like shadow. After the administration of barium, the aorta was seen to indent the esophagus to the left on its right margin. Examination in the left anterior oblique position showed that the right ventricle was not greatly enlarged; indeed, the left ventricle appeared larger than the right ventricle. The esophagus was seen to be indented by the aorta in the left anterior oblique position; in the right anterior oblique position its descent was independent of the aorta. There was no enlargement of the left auricle.

The clinical diagnosis was an extreme tetralogy of Fallot with a right aortic arch.

On Jan. 6, 1945 the patient returned for a check-up and because her parents wished to discuss the possibility of operation. The physical findings were essentially the same as previously noted but she was even more severely incapacitated. She could not walk 30 feet without exhaustion, and she panted when she moved from a wheel chair to the examining table. The fluoroscopic findings were essentially the same as noted previously except that the shadows at the hili of the lungs were more conspicuous. There were, however, no pulsations visible in this region.

The patient returned on January 29. Studies on the arterial blood are recorded in table 1.

A sample of venous blood showed that the red blood cell count was 7,500,000, the hemoglobin was 24 Gm., the hematocrit

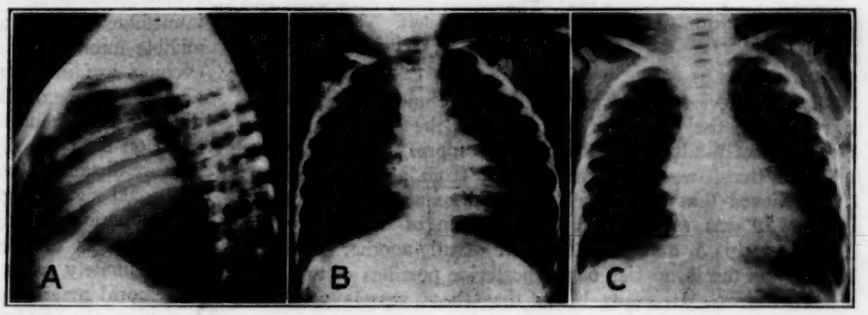

Fig. 4 (case 1).—Appearance before and after operation: *A*, left anterior oblique view before operation; *B*, anteroposterior view before operation; *C*, anteroposterior view after operation.

reading was 71 (Wintrobe) and the white blood cell count was 5,200. The electrocardiogram was essentially the same as that taken in 1943. A roentgenogram of the heart showed a small heart with a right aortic arch. The maximal right diameter was 4 cm. and the maximal left was 7 cm. The total transverse diameter was 26 cm. The cardiothoracic ratio was 42.4.

Operation.—This was performed on February 3. The procedure consisted in anastomosing the divided proximal end of the innominate artery to the side of the left pulmonary artery. This is shown diagrammatically in figure 5. The anesthetic agent was administered by Dr. Austin Lamont.

TABLE 1.—*Studies on Arterial Blood (Case 2)*

Dates	Arterial Oxygen Content, Volumes per Cent	Arterial Oxygen Capacity, Volumes per Cent	Arterial Oxygen Saturation, per Cent	Arterial Carbon Dioxide Content, Volumes per Cent
2/ 1/45	11.7	32.3	36.3	34.9
2/ 3/45	Innominate artery anastomosed to left pulmonary artery			
2/12/45	20.3	27.5	73.8	37.8
3/ 1/45	19.8	23.9	82.8	37.2

Cyclopropane with a high percentage of oxygen was administered through an endotracheal tube. The incision extended from the left costal margin to the anterior axillary line. The pleural cavity was entered through the third interspace. There were no adhesions between the lung and the chest wall, and the lung looked normal. Although the surgeon had been informed by his pediatric colleague that this patient almost

certainly had a right aortic arch, no special thought was given to the fact, and it caused some surprise when it was noted that the aorta was not on the left side. It was fortunate, however, that the incision had been made on the left because this allowed the use of the innominate artery rather than the subclavian artery. There was a very tortuous artery, which

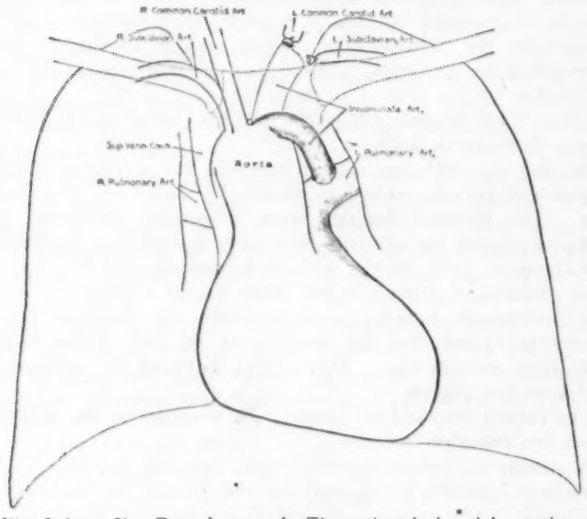

Fig. 5 (case 2).—Procedure used. The patient had a right aortic arch, and the innominate artery was directed to the left. The end of the innominate artery was anastomosed to the side of the left pulmonary artery.

was lying anterior to the vertebral column and which appeared to run from the region of the hilus of the lung toward the upper part of the left pleural cavity. Compression of this vessel indicated that the blood was flowing from above downward. It is believed that this vessel was a large accessory bronchial artery. It was estimated that the lumen of this artery was approximately 3 mm. in diameter. Still another abnormal finding was the large size of the posterior portions of the intercostal arteries. It seems likely that these vessels were also supplying blood to the hilus of the lung. The evidence of extensive collateral circulation led us to believe that we were probably dealing with a case of complete pulmonary atresia.

The innominate artery was located and dissected free of the surrounding tissues. The encouragement of the first assistant, Dr. William Longmire, played no small part in the continued effort to find a large systemic artery. A bulldog arterial clamp was placed on the innominate just distal to its origin from the aorta. The subclavian and common carotid arteries were ligated near their points of origin from the innominate. The innominate artery was divided just proximal to these ligatures. It was estimated that the diameter of the lumen of the innominate artery was approximately 1.3 cm. The left main pulmonary artery was then prepared for the anastomosis. A bulldog clamp was placed just distal to the origin of this vessel from the main pulmonary artery, and a second clamp was placed proximal to its entrance into the lung. A transverse opening was made into the lumen of the vessel midway between the two clamps. A suture anastomosis was performed between the end of the innominate artery and the side of the left pulmonary artery. The length of time that the left pulmonary artery was occluded was fifty to sixty minutes. The bulldog clamps were removed. There was bleeding from one point, which was controlled by an additional suture. An easily palpable thrill was felt in the pulmonary artery both proximal and distal to the anastomosis. The pulmonary artery seemed to be considerably larger than before this new current of systemic blood was admitted to it. The systemic arterial pressure was 110 systolic and 70 diastolic at the time that the arterial clamps were removed. Immediately following the removal of the clamps the systemic pressure declined 30 mm. of mercury. There followed a rise in systolic pressure of 20 mm. of mercury, but the pressure then declined gradually during the next thirty minutes until it reached 60 systolic and 30 diastolic. The pulse rate during this time rose from 72 to 120 per minute.

After the completion of the anastomosis and the removal of the clamps, several grams of sulfanilamide were placed in the pleural cavity. The left lung was partially inflated by the use of positive pressure, and the incision in the chest wall was closed. The patient was given a slow continuous intravenous drip of isotonic solution of sodium chloride during the operation and her condition at the end of the operation appeared to be satisfactory.

The operation required two hours and forty minutes. A considerable part of this time was consumed in studying the tortuous vessel which was seen above the hilus of the lung and also in trying to locate the innominate artery.

The patient awakened from the anesthesia a short time after the closure of the incision. She could move the left arm without difficulty. The left arm and hand were slightly cooler than the right, but it was evident that the circulation was adequate to maintain life. There was no evidence of a cerebral disturbance as the result of the ligation of the common carotid. No pulse could be felt in the left arm or the left side of the neck and face.

Postoperative Course.—This was smooth. There was no vomiting following operation, and fluids were taken by mouth. She was placed in an oxygen tent. The administration of penicillin was started immediately after operation and was continued for nine days. The left pleural cavity was aspirated twenty-four hours after operation; 250 cc. of air and 70 cc. of blood were removed. There were no other thoracenteses. Although a thrill was palpable at the site of the anastomosis immediately on release of the bulldog clamps, no murmur was audible immediately after the chest was closed. By the second evening a faint diastolic murmur was audible over the base and at the apex. By the third postoperative day an extraordinarily loud continuous murmur was audible throughout the chest on both the right and the left side. The oral administration of dicumarol was begun on the fourth postoperative day; 50 to 200 mg. was given daily for several weeks. Prothrombin determinations were performed daily. The dose of dicumarol was such as to keep the clotting time of the patient's blood approximately twice that of the normal control.

Femoral arterial punctures were performed on the ninth and twenty-sixth postoperative days. The results of the analyses are given in table 1. Before operation the red blood cell count was 7,500,000, the hemoglobin 24 Gm. and the hematocrit reading 71. Three days after operation the red blood cell count had decreased to 6,000,000, the hemoglobin to 19 Gm. and the hematocrit reading to 61. By the twenty-first day the red blood cell count was 6,000,000, the hemoglobin was 17.5 Gm. and the hematocrit reading was 55.

A roentgenogram of the heart taken ten days after operation showed that the heart had increased in size; that taken twenty-one days after operation revealed no further increase in size.

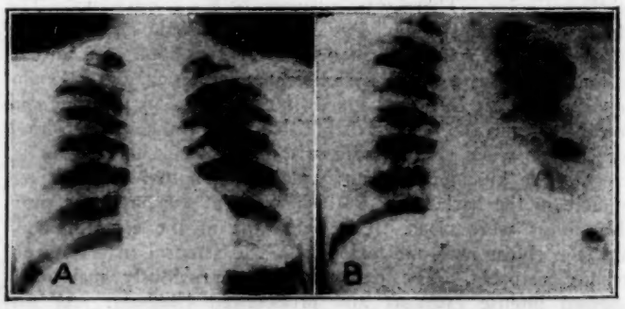

Fig. 6 (case 2).—Heart *A*, before operation and *B*, one month after operation.

Indeed, the heart was a trifle smaller than on the previous date. Roentgenograms of the heart before and after operation are shown in figure 6. Before operation the cardiothoracic ratio was 42.4 and three weeks after operation it was 44.7. The electrocardiogram showed no change (fig. 7). The stethocardiogram showed a continuous murmur (fig. 8). There was a significant increase in the pulse pressure. The preoperative arterial pressure had been 110 systolic and 90 diastolic. On

the thirty-seventh postoperative day the arterial pressure was 98 systolic and 66 diastolic.

An appreciable diminution in the cyanosis of the lips and fingernails was apparent several days after operation. The patient was allowed to walk, beginning two and a half weeks after operation. This exercise resulted in a slight increase in the cyanosis, but it was evident that cyanosis was much less than it had been preoperatively. By the end of the third week she could walk 60 feet in an erect posture without panting, whereas before operation, stooping and leaning forward, she could walk only 30 feet and would then stop and pant. There has been a slow but steady recession of the clubbing of the fingers and toes. The patient was discharged from the hospital on the thirty-eighth postoperative day.

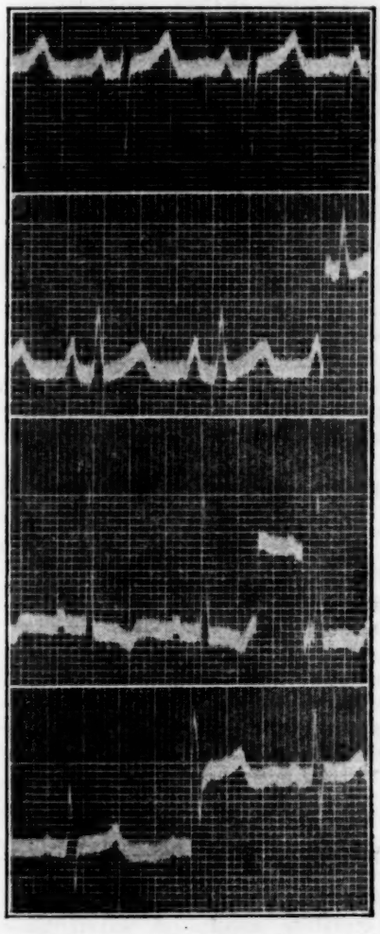

Fig. 7 (case 2).—Electrocardiogram.

CASE 3.—*History.*—M. M., a boy born July 15, 1938, was first seen at the Harriet Lane Home at 8 months of age with the complaint of heart trouble.

The family history is of importance in that the maternal grandfather was known to have heart trouble and had had a heart murmur throughout his life. The mother's brother and sister are both reported to have dextrocardia; both have refused examination.

The past history stated that the patient was a full term baby. The birth weight was 6½ pounds (2,955 Gm.). Development was slow; he held his head up at 5 months and sat alone at 6½ months. At 8 months the patient weighed 13½ pounds (6 Kg.). When lying quietly he showed slight persistent cyanosis, which became intense when he cried. On examination of the heart there was no thrill but a very definite systolic murmur, which was audible all over the precordium and well heard in the back. Fluoroscopy showed that the heart was within normal limits in size. There was a wide shadow above the heart which was interpreted as a large thymus. There was no fulness of the pulmonary conus, and the shadow at the base of the heart was concave. The clinical diagnosis was tetralogy of Fallot.

The patient was followed in the cardiac clinic until January 1940, when the family moved to California. They returned to Baltimore in the fall of 1944 and the patient was again brought to the clinic on September 29. At that time the boy, 6 years of age, was thin and undernourished, intensely cyanotic and dyspneic on slight exertion. The temperature was 99.2 F., weight 34½ pounds (15.6 Kg.), height 42 inches (107 cm.), pulse 140, respirations 20 and blood pressure 90 systolic and 60 diastolic.

There was manifest suffusion of the conjunctiva. The lips were purple and the buccal mucous membranes were a deep mulberry color. The teeth were in bad condition; the tonsils were not unduly enlarged. The chest was barrel shaped. The increase in the size of the heart was in proportion to the growth of the child. There was a systolic thrill at the apex and a harsh systolic murmur, which was maximal along the left sternal border in the third interspace. The second sound at the base of the heart was clear but not accentuated. The lungs were clear. The liver was at the costal margin; the spleen was not palpable. The femoral arterial pulsations were easily felt. The extremities showed deep cyanosis and pronounced clubbing. Although the patient had learned to walk by November 1944, he was so incapacitated that he was unable to walk and even refused to try to take a few steps. The diagnosis was tetralogy of Fallot with a severe degree of pulmonary stenosis.

The patient was referred to the dental clinic, where several teeth were extracted. Sulfadiazine was given for two days. One month later the patient returned to the cardiac clinic with a rectal temperature of 100.4 F. and with numerous petechiae on his legs, which the mother said were of two days' duration. A blood culture taken at this time was sterile and no further petechiae appeared.

TABLE 2.—*Studies on Arterial Blood (Case 3)*

Dates	Arterial Oxygen Content, Volumes per Cent	Arterial Oxygen Capacity, Volumes per Cent	Arterial Oxygen Saturation, per Cent	Arterial Carbon Dioxide Content, Volumes per Cent	Comment
2/ 8/45	7.3	31.2	23.4	27.5	Patient struggling
2/ 9/45	10.7	30.2	35.5	29.3	Patient quiet
2/10/45	Innominate artery anastomosed to right pulmonary artery				
2/19/45	17.7	22.2	79.7	37.4	Patient crying
3/ 6/45	17.7	21.1	83.8	35.3	Patient quiet

The family was desirous of prompt operation and the patient was admitted to the hospital on Feb. 7, 1945. The results of analyses of blood obtained by arterial puncture are shown in table 2. With venous blood the red blood cell count was 10,000,000, the hemoglobin 26 Gm. and the hematocrit reading 81. The patient continued to have a daily elevation of temperature.

An electrocardiogram showed a normal sinus mechanism, a normal PR interval of 16, high P waves in L_2, and normal upright T waves in leads 1, 2 and 4, and T_3 inverted and an apparent right axis deviation.

X-ray examination (fig. 10) showed that the maximal right diameter of the heart was 2.1 cm., the maximal left 7 cm. and the total transverse diameter 18.8 cm.; the cardiothoracic ratio was 47.5. There was no fulness of the pulmonary conus. Fluoroscopy showed that the aorta descended on the left, and there were no visible pulsations in the lung fields.

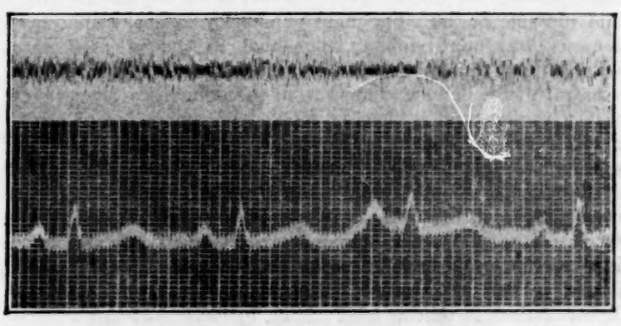

Fig. 8 (case 2).—Stethocardiogram.

Operation.—This was performed on February 10. The procedure consisted in anastomosing the divided proximal end of the innominate artery to the side of the right pulmonary artery. This is shown diagrammatically in figure 9. The anesthetic agent was administered by Dr. Merel Harmel.

Anesthesia was produced by cyclopropane with a high concentration of oxygen. It is of interest that the patient's color was much better under anesthesia than it had been previously.

This patient did not have a right aortic arch. In view of the great improvement in the second case we wished to use the innominate artery, and therefore the incision was made on the right side. There were no adhesions between the lung and the chest wall, and the lung appeared normal. The right upper lobe was retracted downward and the azygos vein was visualized. It was doubly ligated and divided. The superior vena cava and phrenic nerve were retracted medially, and the artery to the right upper lobe of the lung was seen. This was followed medially and the main right pulmonary artery was exposed. This exposure was considerably more difficult than that on the left side. Attention was then turned to the innominate artery. By dissecting under and medial to the superior vena cava the innominate artery was exposed and was dissected free of the surrounding tissues. This vessel was occluded temporarily by the use of a lung tourniquet which was equipped with a catheter overlying a piece of braided silk. The subclavian artery and the common carotid artery were ligated just distal to their origins from the innominate artery. The innominate artery was cut across proximal to these ligatures. Two bulldog clamps were placed on the right main pulmonary artery, and a transverse incision was made into the vessel between these clamps. The proximal bulldog clamp was not of sufficient length to secure entire control of the flow of blood. This resulted in a moderate loss of blood, and another clamp was substituted.

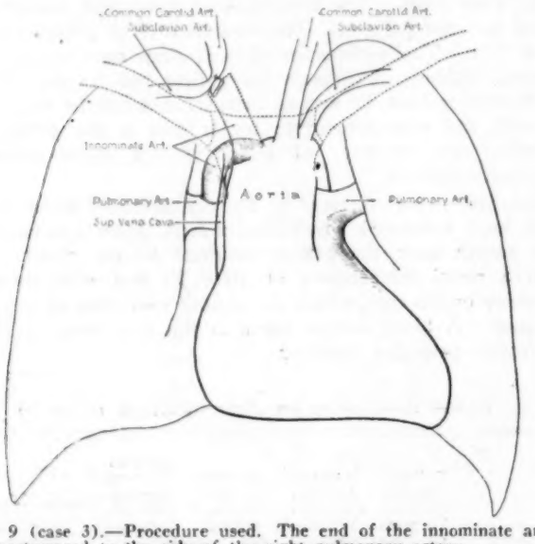

Fig. 9 (case 3).—Procedure used. The end of the innominate artery was anastomosed to the side of the right pulmonary artery.

With 5-0 silk on a small curved needle an anastomosis was made between the divided proximal end of the innominate artery and the side of the right main pulmonary artery. This anastomosis was more difficult than that in the previous cases because the exposure was less satisfactory. Following the removal of the bulldog clamps from the pulmonary artery there was a rather copious flow of blood from one point along the anterior row of sutures. The clamps were reapplied, and this opening was closed with a mattress suture. Subsequent removal of the clamps did not result in further bleeding. The patient's condition up to the time of this blood loss had been excellent. Occlusion of the right pulmonary artery had not seemed to increase the cyanosis. There was an increase in the cyanosis and a decline in pressure when this loss of blood occurred. It was estimated that at least 250 cc. of blood was lost.

The anastomosis seemed to be a satisfactory one. An easily palpable thrill could be felt in the pulmonary artery both proximal and distal to the anastomosis. It was estimated that the lumen of the innominate artery was slightly less than 1 centimeter in diameter. The right lung was partially inflated and the incision in the chest wall was closed.

The patient received 500 cc. of a mixture of isotonic solution of sodium chloride and glucose and 200 cc. of plasma during the operative procedure. The operation required a total of three hours, the greater part of this time being consumed in making the anastomosis. It was obvious that a better instrument for occluding the pulmonary artery proximal to the site of the anastomosis is needed. The right pulmonary artery was occluded for approximately ninety minutes.

The patient's condition at the completion of the operation was very good. He was conscious a few minutes after the incision had been closed, was asking for water and was moving his right arm. This arm was slightly cooler than the left. Pulsations could not be felt in the right arm or in the right side of the neck and the face. There was, however, no evidence of cerebral damage, and it was obvious that the circulation of the arm was adequate to maintain life.

Postoperative Course.—This was remarkably smooth. The patient was placed in an oxygen tent for several days. The circulation to the right arm remained adequate. Aspiration of the chest was not necessary. Immediately after operation the child's color improved. It was seen on the fourth postoperative day when the administration of oxygen was discontinued that the cyanosis of the lips had disappeared. The cyanosis of the fingertips decreased more slowly. The administration of penicillin was started the day before the operation and was continued for three weeks postoperatively. Dicumarol was given by mouth, beginning on the third postoperative day. The usual daily administration was 25 mg. Prothrombin determinations were performed daily, and the drug was continued for three weeks.

Although a thrill was palpable at the site of the anastomosis after the arterial clamps had been released, no murmur was audible immediately after the chest had been closed. By the first evening a faint murmur was audible, which gradually increased in intensity. By the fourth postoperative day a continuous murmur was audible over the site of the anastomosis and posteriorly throughout both lungs.

The child's compensation has remained excellent. In contrast to a preoperative arterial pressure of 85 systolic and 65 diastolic, the arterial pressure postoperatively was usually 106 systolic and 52 diastolic. The heart increased somewhat in size during the first ten days after operation, but there did not appear to be a further increase in the subsequent two weeks. Roentgenograms of the heart both before and after operation are shown in figure 10.

Arterial punctures were performed on the 9th and 24th postoperative days. The results of the analyses are given in table 2. On comparing the preoperative studies with those performed twenty-four days after operation, samples of venous blood showed that the red blood cell count decreased from 10,000,000 to 6,000,000, the hemoglobin from 26 to 20 Gm. and the hematocrit reading from 81 to 53 (Wintrobe).

The patient had had a preoperative daily elevation of temperature to 100 F., and this continued for three weeks after operation. For this reason he was not allowed out of bed despite his vigorous protests until three and a half weeks after operation. When permitted to do so, the child walked 40 feet with ease. He was then allowed to be up for several hours each day and has walked and played in his room. He did not develop either cyanosis or dyspnea on this activity. The patient was discharged from the hospital on the thirty-eighth postoperative day.

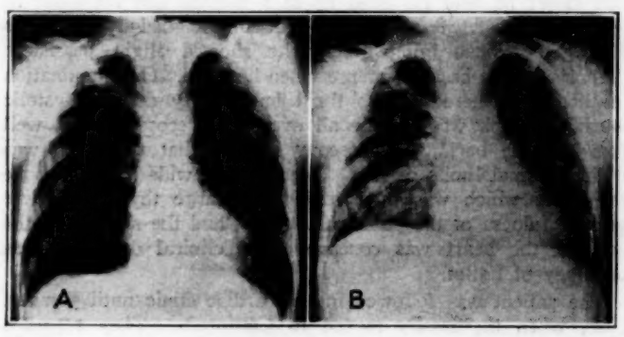

Fig. 10 (case 3).—Heart *A*, before operation and *B*, two weeks after operation.

COMMENT

Each of these 3 patients suffered from such a severe degree of pulmonary stenosis that there was inadequate circulation to the lungs. Although the three operations differed in detail, in each instance the operation greatly increased the volume of blood which reached the lungs.

In the first case the end of the left subclavian artery was anastomosed to the side of the left pulmonary artery. As the baby was small and weak, extensive laboratory studies were not performed. Before operation the baby had been steadily losing ground. She had ceased to be able to sit alone; she had refused her feedings and had lost weight. The red blood cell count had declined from 7,000,000 to 5,000,000; consequently the cyanosis had diminished considerably. After operation her clinical improvement was remarkable. The appetite improved, she gained weight and she is now starting to learn to walk.

The second patient had a right aortic arch; hence it was possible to anastomose the innominate artery to the left pulmonary artery. The patient was deeply cyanotic and severely incapacitated and could not walk 30 feet without panting. Two and a half weeks after operation she walked 60 feet, rested a short time and walked 60 feet back to her room and sat down quietly. The seriousness of her condition and the extent of the improvement are shown by the changes in the oxygen saturation of the arterial blood, which was 36.3 per cent before operation and which rose to 82.8 per cent three weeks subsequently. The red blood cell count dropped from 7,500,000 to 6,000,000, the hemoglobin from 24 Gm. to 17.5 Gm. and the hematocrit reading from 71 to 55.

The success of the second operation led us to perform the same operation in the third case. Since the aorta was in the normal position, in order to use the innominate artery the operation was performed on the right side. The end of the innominate artery was anastomosed to the side of the right pulmonary artery. The patient was younger, and improvement was even more dramatic. Before operation he was intensely cyanotic, the lips were a dark purple, and the child was unable to take even a few steps. The day after operation he lay in an oxygen tent with cherry red lips. When taken out of the tent his color remained good. His disposition has changed from that of a miserable whining child to a happy smiling boy. We were slow to permit him to walk because of a persistent low grade fever, but at the end of the third postoperative week he could walk 40 feet without panting and without becoming cyanotic. The oxygen saturation of the arterial blood rose from 35.5 to 79.7 per cent in nine days, and it reached a saturation of 83.8 per cent twenty-four days after operation. The red blood cell count fell from 10,000,000 to 6,000,000; the hemoglobin decreased from 26 Gm. to 20 Gm. and the hematocrit reading from 81 to 53.

There are a number of features of the operative procedure which merit discussion. We were fearful that an intensely cyanotic child would not tolerate a long operative procedure in which it was necessary to open the pleural cavity and to occlude temporarily one of the pulmonary arteries. For this reason our first clinical attempt to increase the circulation to the lungs was postponed almost a year after it was decided that the procedure was a sound one, with the hope that some method of administering oxygen in addition to inhalation might prove satisfactory. This seemed particularly important since it was obvious that a new and untried procedure should be performed first on patients with a severe degree of anoxemia whose outlook without aid of some sort was hopeless. Although the use of intravenous oxygen has been reported by Ziegler [12] and may prove to be of benefit in this operation, it was impossible during wartime to procure the necessary equipment. Therefore this method could not be studied.

From our limited experience it appears that this type of patient can tolerate the use of inhalation agents for general anesthesia. We have been fortunate in this respect in that the anesthetic agents were chosen and administered expertly by Dr. Austin Lamont and Dr. Merel Harmel.[13] The first of these 3 patients was only 14 months of age and weighed less than 9 pounds. Ether by the open drip method was used during the major part of the procedure for the reason that a sufficiently small closed system was not available. In the anesthetization of the second and third patients, cyclopropane with a high concentration of oxygen was employed. Fortunately the administration of oxygen apparently increased the oxygen content of the arterial blood and cyanosis was definitely lessened. Although in only 1 patient was there any serious hemorrhage, the precaution was taken of having both blood and plasma readily available. Indeed, a slow continuous drip of plasma is advisable so that at a moment's notice if necessary the patient can be given large quantities of plasma. With these precautions no great difficulty was encountered in spite of the fact that two of the three operations required three hours.

The next question which arose was whether a patient who was already suffering from a severe degree of anoxemia would tolerate the occlusion of one of the main pulmonary arteries for the period during which the anastomosis was being performed. These periods of occlusion were approximately thirty, sixty and ninety minutes in the three operations. It is a remarkable fact that the cyanosis did not appear to be greatly increased during the occlusion period. It may be that the decreased flow of blood to the lungs caused by the congenital deformity rendered it possible for the opposite artery and lung to utilize this reduced volume almost as effectively as could the two lungs. Be that as it may, the 3 children tolerated occlusion of the left or the right main pulmonary artery for periods ranging from approximately thirty to ninety minutes.

Another question which arose was whether ligation and division of the left subclavian artery or the innominate artery would result in serious impairment of the circulation to the arm and the brain. In most instances heretofore these vessels have been occluded because of preexisting disease such as aneurysm, and it is possible under such circumstances that there has been a prolonged stimulus for the formation of collateral arterial pathways. It was gratifying, therefore, to note in our patients that there was little evidence of impairment of circulation to the parts deprived of their major arterial pathway. It is true that the pulse was absent for some time postoperatively and the part was slightly cooler than that of the opposite part of the body, but immediately after operation it was evident that the circulation was adequate to maintain life of the part. It may prove desirable to perform an upper dorsal sympathectomy at the time of operation. This would not add to the gravity of the operative procedure, since one has an excellent exposure of this region in perform-

12. Ziegler, E. E.: Intravenous Administration of Oxygen, J. Lab. & Clin. Med. **27**: 223-232 (Nov.) 1941.

13. Drs. Lamont and Harmel will deal with this subject in a subsequent communication.

ing the arterial anastomosis. In future cases the circulation of the arm will be studied more carefully.

The operation has not been attempted before on patients and there are many operative as well as clinical features which are still under investigation. The first of these is concerned with the type of anastomosis which is to be performed. This will undoubtedly depend on many factors, especially the age of the patient and the degree of anoxemia. As stated previously, in our patients the anastomosis was performed between the end of the subclavian artery or innominate artery and the side of the left or right pulmonary artery. This type of anastomosis appears to be sound in that it allows the blood to flow from the systemic circulation to both lungs. The fact that the continuous murmur which results from the operation is readily audible on both sides of the chest indicates that the anastomosis does direct blood to both lungs. It was this type of anastomosis which was used by Eppinger, Burwell and Gross [8] in their studies on the cardiac output of dogs with an artificial ductus arteriosus.

The easiest of the end to side arterial anastomoses in this region is that between the end of the left subclavian artery and the side of the left pulmonary artery. On the other hand, the subclavian artery is so small in an infant that the chances of the occurrence of thrombosis at the anastomotic site are great. This is particularly true if the patient has extreme polycythemia. Even though the anastomosis remains patent, the size of the vessel is a limiting factor in the flow of blood to the lungs which may not be sufficient to overcome the high degree of anoxemia from which some of these patients suffer. In an older patient with only a moderate degree of cyanosis the subclavian artery would appear to be the ideal vessel. The left common carotid is somewhat larger than the left subclavian artery, and its employment under some circumstances seems to be warranted. When dealing with the degree of anoxemia which was present in our patients, the innominate artery is much to be preferred to the left subclavian artery or the left common carotid artery. The performance of the anastomosis is not very difficult when the left pulmonary artery can be used. The anastomosis of the innominate artery to the left pulmonary artery is possible only in patients with a right aortic arch and hence an innominate artery on the left. With the innominate artery in its normal position the anastomosis of this vessel to the right pulmonary artery is more difficult because so much of the latter artery lies behind the aorta and the superior vena cava. Improvements in the designs of instruments will facilitate this procedure.

It is important to bear in mind that the degree of impairment in the flow of blood to the lungs varies from patient to patient, and the selection of the vessel to be used depends on the extent of the need of the patient for an increase in the circulation to the lungs. Experimental observations and clinical trial and error will undoubtedly shed additional light on this subject. It is obvious that the vessel chosen and the size of the anastomosis itself should not be larger than is necessary for the relief of anoxemia because of the danger associated with excessive shunting of blood to the lungs.

There are other methods in addition to union of an end of a systemic artery to the side of a pulmonary artery by which an anastomosis between the two circulations may be made. Included among these are (1) anastomosis of the divided proximal end of one of the vessels which arise from the aortic arch (innominate, left common carotid, left subclavian) to the divided distal end of one of the two pulmonary arteries, (2) anastomosis of the divided proximal end of the subclavian artery or the common carotid artery to the divided proximal end of the pulmonary artery to an upper lobe of one of the lungs, (3) anastomosis of the side of the aorta to the side of the left pulmonary artery and (4) anastomosis of the side of the aorta to the side of the left pulmonary artery. These will be considered in the order in which they are enumerated.

The results of the use of the first method, in which the divided proximal end of the left subclavian artery is anastomosed to the divided distal end of the left main pulmonary artery, were reported in 1939 by Levy and Blalock.[7] It was stated that "dogs which have been observed for several months following this procedure appear entirely normal. The left lung was aerated and the respiratory movements were unaltered. The systemic arterial blood pressure was not affected by this operation. The blood pressure in the pulmonary artery only a short distance beyond the anastomosis was less than half of that in the systemic arteries. This was due to the relatively low peripheral resistance in the pulmonary bed. Since only arterial blood entered the left lung, the quantity of oxygen consumed by this lung was very small. However, when anoxemia was caused, a larger quantity of oxygen was taken up by the incompletely oxygenated arterial blood. The left lung appeared pinker than the right on gross examination during life. Microscopic examination revealed no noteworthy alteration in either the left pulmonary artery or lung." Some of these animals have now been observed over periods ranging up to six years. The only disturbing finding has been that a few of the animals at autopsy have shown a thickening of the left pulmonary artery. It was noted by Dr. Arnold Rich that this was found only in instances in which the anastomotic site was partially occluded as a result of thrombosis. The discrepancy in the size of the left subclavian artery and that of the left pulmonary artery may have accounted in part for this finding. Furthermore, this discrepancy in size may be responsible in part for the sudden diminution in the arterial pressure just beyond the point of anastomosis. At any rate, it is improbable that the anastomosis of the subclavian artery to the end of the left pulmonary artery would be the procedure of choice in the treatment of pulmonic stenosis. If this type of anastomosis should be performed, the innominate artery would be a better choice than the subclavian because it is more nearly the size of the pulmonary artery. It may be found that an end to end anastomosis is more apt to remain patent than an end to side one; certainly it is technically easier to perform. If, in the process of performing an anastomosis between the end of the innominate artery and the side of one of the pulmonary arteries, the latter vessel should be torn beyond repair, it should be borne in mind that an anastomosis may still be performed between the end of the innominate and the distal end of the pulmonary artery. Experimental studies are being carried out on the relative virtues of end to end and end to side anastomoses.

A second alternative method consists in anastomosing the proximal end of the divided subclavian or carotid artery to the proximal end of the divided pulmonary artery to one of the upper lobes. Since it is technically easier to perform an end to end than an end to side anastomosis, one may consider the advisability of using

this procedure for a patient with only a slight degree of cyanosis. The proximal end of the pulmonary artery is specified because this would conceivably allow blood to gain access to all the lobes except the one supplied by the artery which was used for the anastomosis. This procedure has been performed in the laboratory and is not difficult.

The third possible operative procedure is concerned with an anastomosis of the side of the aorta to the side of the left pulmonary artery. That such a procedure is possible in dogs has been shown by Leeds [9] in his studies on patent ductus arteriosus. We considered the use of this method in our patients but were discouraged by the experience of Blalock and Park [10] in studies on experimental coarctation of the aorta. In these experiments the aorta was divided just distal to the ligamentum arteriosum, the two ends of the aorta were closed, the left subclavian artery was divided at some distance from the arch of the aorta, and the proximal end of the divided subclavian artery was anastomosed to the side of the distal end of the aorta just below the point at which it had been divided. Thus the subclavian artery was used for the conduction of blood beyond the point of division of the aorta. The discouraging feature of these experiments was that in approximately half of the animals the hind legs were paralyzed at the completion of the operative procedure. In 1 dog in which we occluded the aorta for forty minutes for the purpose of making an anastomosis between the side of the aorta and the side of the left pulmonary artery the hind legs became paralyzed. It is impossible to make an accurate anastomosis between the aorta and the left pulmonary artery without interrupting temporarily the circulation through the two vessels. We were fearful of causing a paralysis of the lower extremities and hence did not use this method with our patients. Another difficulty associated with the use of the aorta is that its walls are thick and rather friable and it is difficult to obtain an accurate approximation of the intimal surfaces.

The fourth method to be considered is that of an anastomosis of the aorta and the main pulmonary artery. It is obvious that occlusion of these vessels for the length of time that is required for an open suture anastomosis would result in death. If such a union was to be secured, it would have to be done by some other method. Fortunately the first portions of the medial walls of the aorta and the pulmonary artery are intimately adherent to each other. The ascending aorta and the main pulmonary artery are contained within the pericardial cavity and are enclosed in a tube of serous pericardium common to the two vessels. We have been able to produce a fistula between the two vessels in dogs by inflicting a stab wound in this region. The knife blade was introduced through the opposite free wall of the pulmonary artery, the walls of the pulmonary artery and aorta which were in intimate contact were pierced, the knife was withdrawn, and the opening in the free side of the pulmonary artery was closed by sutures. The establishment of the fistula required only a few seconds. This method is mentioned because it may be necessary to use the major blood vessels and to employ considerable speed if newborn infants with pulmonary stenosis or atresia are to be saved. It would not be at all surprising if this experimental method should prove to be a useful one in patients.

It remains to be proved whether a communication between the two circulations should be brought about by direct anastomoses between blood vessels such as we have employed or by the use of tubes such as those devised for other purposes by Blakemore, Lord and Stefko.[14] It is our impression that the suture method is preferable when it can be accomplished without undue tension. This method obviates the necessity for leaving a large foreign body in the tissues; furthermore, there is at least a possibility that the opening will increase in size with the growth of the child. Studies on the latter point are in progress. These comments are in no sense a criticism of the Blakemore method, which is of great value in those instances in which part of a blood vessel has been destroyed and the ends cannot be united by direct suture.

One of the possible complications which causes concern is the danger of thrombosis at the anastomotic site. The improvement of our 3 patients indicates that thrombosis has not occurred. Furthermore, in cases 2 and 3 loud continuous murmurs developed after operation. As mentioned previously, partial occlusion of the anastomotic site has been found in some of the dogs in which such anastomoses were performed. Partial occlusion of the opening and emboli in the lungs were found at autopsy in 1 animal in which the end of the subclavian artery had been anastomosed to the side of the left pulmonary artery. This experiment was complicated by the previous creation of bilateral pulmonary arteriovenous fistulas. The sizes of the vessels used and the size of the communication between the two vessels are, of course, of prime importance in the determination of whether or not the opening will remain patent. This consideration is another point in favor of using a large vessel such as the innominate artery. Because of the difference in pressure on the two sides of the anastomotic site between the systemic and pulmonary circulations, it would be more likely that such an anastomosis would remain open than communications of similar size between two systemic arteries or two systemic veins.

As previously stated, most patients with the type of malformation of the heart under consideration have a decided polycythemia and an increased viscosity of the blood. This condition undoubtedly increases the danger of thrombosis. Indeed, cerebral thromboses are of not infrequent occurrence in these patients. Therefore the question arose as to whether these patients should receive heparin shortly after the termination of the operation. After much deliberation it was decided that the possible dangers were greater than the possible advantages. This opinion, however, is subject to change. By way of compromise, it was decided to give dicumarol during the period of convalescence. Therefore, beginning respectively on the fourth and third postoperative days the second and third patients were given dicumarol in small quantities. Prothrombin determinations were made daily and the dose of dicumarol was regulated so as to keep the clotting time approximately double that of the normal control. This medication was continued for a period of approximately three weeks. It is impossible to state whether this therapy has been of importance in the maintenance of the patency of the fistulas.

In order to understand the changes produced by the operation and its application to other malformations, it is essential to understand the nature of this malformation and the course of the circulation. The four features which constitute the tetralogy of Fallot are pulmonary stenosis, dextroposition of the aorta, an inter-

14. Blakemore, A. H.; Lord, J. W., Jr., and Stefko, P. L.: Restoration of Blood Flow in Damaged Arteries: Further Studies on Nonsuture Method of Blood Vessel Anastomosis, Ann. Surg. **117**: 481-497, 1943.

ventricular septal defect and right ventricular hypertrophy. The pulmonary stenosis consists in a narrowing of the pulmonary orifice, and it is usual to find that the constriction also involves the pulmonary conus of the right ventricle. Dextroposition of the aorta means that the aorta rises from the left ventricle and partially overrides the right ventricle. Whenever this occurs, the aortic septum cannot meet the ventricular septum; consequently there is a high ventricular septal defect. Such is the nature of an interventricular septal defect in the tetralogy of Fallot. The malformation renders it difficult for the blood to be expelled from the right ventricle; hence there is hypertrophy of that chamber. The structure of the heart and the course of the circulation are diagrammatically shown in figure 11.

The degree of incapacity in a tetralogy of Fallot depends on the severity of the pulmonary stenosis and the degree of the overriding of the aorta. It is well known in cases in which the pulmonary stenosis is not extreme that the malformation is compatible with relative longevity. However, with extreme degrees of pulmonary stenosis and greatly diminished circulation to the lungs, the condition causes severe incapacity and death occurs at an early age.

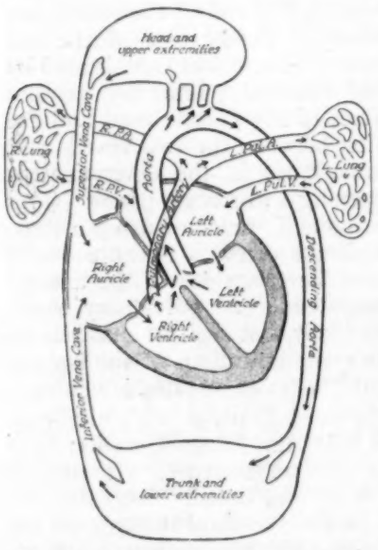

Fig. 11. Diagram of the course of the circulation in the tetralogy of Fallot. In this malformation there is pulmonary stenosis, the aorta is dextroposed and hence receives blood from both ventricles, the ductus arteriosus undergoes normal obliteration and the foramen ovale is closed. The blood from the right auricle flows into the right ventricle; hence part of the blood is pumped through the stenosed pulmonary orifice into the pulmonary artery and part of the blood is pumped directly into the aorta. Only that portion of the blood from the right ventricle which is pumped into the pulmonary artery goes to the lungs for aeration and is returned to the left auricle and the left ventricle. All of the blood from the left ventricle and some of the blood from the right ventricle is pumped out into the aorta to the systemic circulation and is returned by the superior vena cava and the inferior vena cava to the right auricle. There the cycle starts again.

The anastomosis of the innominate artery to the pulmonary artery directs a large volume of blood from the systemic circulation into the pulmonary circulation. By this means the volume of blood which reaches the lungs for aeration is increased; it follows that a greater volume of oxygenated blood is returned by the pulmonary veins to the left auricle and the left ventricle; consequently a greater volume of oxygenated blood is pumped out into the systemic circulation. As some blood from the aorta is diverted to the pulmonary circulation, the volume of blood to the systemic circulation is decreased and less blood is returned to the right auricle and the right ventricle. Thus the volume of blood which is returned to the right ventricle is lessened and that which is returned to the left side of the heart is increased. The alteration in the course of the circulation as influenced by the operation is shown in figure. 12.

In short, the operation enables some blood to bypass the obstruction to the pulmonary circulation. Hence the operation should be of value in all malformations in which the primary difficulty is due to lack of adequate circulation of the blood to the lungs; that is, in all cases of the tetralogy of Fallot and complete pulmonary atresia, in cases in which the right ventricle is absent or defective in its development, in cases of truncus arteriosus with bronchial arteries, or even a single ventricle with a rudimentary outlet chamber in which the pulmonary artery is diminutive in size.

Complete pulmonary atresia is, of course, compatible with life only as long as the ductus arteriosus remains open unless the bronchial arteries dilate and establish sufficient collateral circulation for the maintenance of life. This, we believe, happened in case 2, as at operation large aberrant vessels were found in the region of the hilus of the left lung. However, in the great majority of cases of pulmonary atresia the closure of the ductus arteriosus is so rapid that adequate collateral circulation does not develop and consequently the condition is fatal in early infancy. In all such cases the operation, if performed early, may be life saving. The same is true in cases of a defective development of the right ventricle in which all of the blood from the right auricle is directed to the left auricle and hence to the left ventricle and out by way of the aorta, and the only circulation to the lungs is by way of the ductus arteriosus.[15] The operation should be equally valuable in cases of truncus arteriosus with bronchial arteries because the bronchial arteries never become sufficiently large to provide adequate circulation to the lungs.

In every instance there is, of course, an admixture of venous and arterial blood. It would be impossible, therefore, to bring the oxygen saturation of the arterial blood to normal; nevertheless, it is conceivably possible to bring the oxygen saturation of the arterial blood sufficiently high so that there would be no "visible" cyanosis. Certainly in the 2 older children there has been an increase in the oxygen content of the arterial blood, a decrease in the oxygen capacity, an increase in the oxygen saturation of the arterial blood, a decrease in the red blood cell count, a diminution in the hemoglobin and the hematocrit reading, a striking decrease in the patients' disability and a great improvement in the patients' ability to exercise.

In cases of the tetralogy of Fallot the heart is either normal in size or relatively small. Following the creation of an artificial ductus, the increased volume of blood which reaches the pulmonary circulation undoubtedly increases the work of the left side of the heart. In our patients the heart has definitely increased in size but compensation thus far has remained excellent. Sir Thomas Lewis [16] has emphasized that in cases of coarctation of the aorta prolonged overwork does not cause cardiac failure. Palmer [17] in his studies on cardiac enlargement showed that, in essential hypertension, cardiac enlargement occurs with the gradual rise in blood pressure and that progressive enlargement does not easily occur after the blood pressure level has become stabilized. Therefore it is our hope and expectation that in this operation, although the heart immediately increases in size in response to the altered blood flow, the condition will not lead to progressive cardiac enlargement. It is encouraging that in both cases 2 and 3, although the heart increased in size in the first ten days, there was no further increase in the second ten days.

15. Taussig, H. B.: The Clinical and Pathological Findings in Congenital Malformations of the Heart Due to Defective Development of the Right Ventricle Associated with Tricuspid Atresia or Hypoplasia, Bull. Johns Hopkins Hosp. **59**: 435-445, 1936.

16. Lewis, T.: Material Relating to Coarctation of the Aorta of the Adult Type, Heart **16**: 205-261, 1933.

17. Palmer, J. H.: The Development of Cardiac Enlargement in Disease of the Heart: A Radiological Study, Medical Research Council Special Report Series, No. 222, 1937.

It is important to emphasize that the operation is not of value to all patients with persistent cyanosis. It is of value only in malformations in which the primary difficulty is lack of circulation to the lungs. The operation would be of no use in cases of complete transposition of the great vessels or in the so-called "tetralogy of Fallot of the Eisenmenger type" and probably not in aortic atresia.

In complete transposition of the great vessels the pulmonary artery arises from the left ventricle and the aorta from the right ventricle. The blood from the left ventricle is pumped out through the pulmonary artery to the lungs and is returned by the pulmonary veins to the left auricle and thence to the left ventricle. The blood from the right side of the heart is pumped out into the aorta to the systemic circulation and is returned by the superior vena cava and the inferior vena cava to the right auricle and the right ventricle. The primary difficulty in this malformation is not in the volume of blood which reaches the lungs but in the mechanism by which the blood which has been oxygenated in the lungs can reach the systemic circulation.

In the Eisenmenger complex cyanosis appears to be due to secondary changes in the alveolar wall or in the pulmonary vascular bed of such a nature as to hinder the aeration of the blood as it passes through the lungs; it is even possible that the high pressure in the lesser circulation may increase the right to left shunt and thereby increase the volume of reduced hemoglobin in the arterial blood. In any event, in this malformation there is no lack of circulation to the lungs and, furthermore, only rarely, if ever, is there deep cyanosis in early childhood.

In aortic atresia[18] not only is there difficulty in pumping blood to the systemic circulation but also the blood which does reach the systemic circulation is pumped through the ductus arteriosus before it has been to the lungs for aeration. Under such circumstances the creation of an additional ductus arteriosus would act to direct a larger volume of blood to the body; but it must be borne in mind that this blood has the same oxygen content as that directed to the lungs.

It is worthy of note in almost all patients with much polycythemia that all of the blood which circulates through the lungs is no longer fully oxygenated. Whether the size of the capillary bed in the lungs varies with the plasma volume and not with the number of red blood cells is not known, but there is clear evidence to show that even in patients in whom the primary difficulty is lack of circulation to the lungs the oxygen saturation of the arterial blood can be appreciably raised by the prolonged inhalation of a high concentration of oxygen. The potency of this factor was demonstrated by the great improvement in the peripheral cyanosis during operation when the patients were receiving oxygen. The importance of the volume of blood which reaches the lungs for aeration is demonstrated in our patients by the extent of the rise in the oxygen saturation of the arterial blood which resulted from the operation; in 1 instance it rose from 36.3 to 82.8 per cent and in the other from 35.5 to 83.8 per cent.

It may be that, with prolonged meager flow of blood to the lungs, secondary changes occur so that the pulmonary capillary bed is no longer capable of complete expansion and restoration to normal. Our 6 year old child showed prompter improvement than did the 12 year old girl. Hence the operation may prove less beneficial to older persons than to young children. For this reason the ideal age for operation appears to be after the systemic pressure has risen sufficiently high to permit the continuous flow of blood from the aorta to the pulmonary artery and before the condition has persisted long enough to cause irreversible changes in the lungs. We believe that the optimal age of patients is probably between 4 and 6 years; however, in all cases in which the closure of the ductus arteriosus renders the malformation incompatible with life the operation must be performed in early infancy.

Since the operation should be of value to all patients in whom the primary difficulty is lack of circulation to the lungs, it behooves the clinician to recognize this condition.[19] The two outstanding features, both of which should be present, are (1) roentgenographic evidence that the pulmonary artery is diminutive in size and (2) clinical and roentgenographic evidence of absence of congestion in the lung fields.

The size of the normal pulmonary artery is not difficult to determine by roentgenography. The striking feature in the roentgenogram is the absence of the fulness of the normal pulmonary conus. The shadow at the base of the heart to the left of the sternum is concave and not convex. A concave shadow in this region in patients with persistent cyanosis always means that the pulmonary artery is misplaced, absent or diminutive in size.[2] When the pulmonary artery is absent or diminutive in size, there is the additional finding in the left anterior oblique position of an abnormally clear pulmonary window.[2]

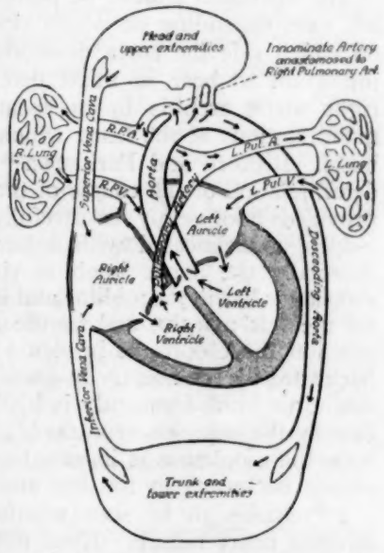

Fig. 12.—Diagram of the course of the circulation in the tetralogy of Fallot after the anastomosis of the innominate artery to the pulmonary artery. Under these circumstances the blood from the right auricle flows into the right ventricle and, as before, part of the blood from the right ventricle is pumped directly into the aorta. Now, in addition to the blood which is pumped through the pulmonary orifice into the pulmonary artery, some of the blood from the aorta is diverted through the anastomosis to the lungs. Thus the volume of blood which reaches the lungs is increased and the volume of oxygenated blood which is returned to the left auricle and the left ventricle is proportionately increased. All of the blood from the left ventricle and also some blood from the right ventricle is pumped into the aorta. Some of the blood from the aorta is directed to the lungs, and the remainder goes to the systemic circulation and is returned by the superior vena cava and the inferior vena cava to the right auricle. Thus the left ventricle receives more blood than before operation and the right side of the heart receives less. The operation has bypassed the obstruction in the circulation of the blood to the lungs.

Absence of clinical and x-ray evidence of congestion in the lungs is highly important in reaching a decision. When circulation to the lungs is inadequate, the diminished blood flow to the lungs lessens the chances of congestion in the lungs and congestion rarely occurs.[2] When congestion does occur, it suggests that the circulation to the lungs is adequate or excessive. The operation should never be attempted when x-ray exam-

18. Taussig, H. B.: Clinical and Pathological Findings in Aortic Atresia or Marked Hypoplasia of the Aorta at Its Base, Bull. Johns Hopkins Hospital, to be published.

19. The following discussion is based mainly on original unreported observations which are dealt with in detail in chapters II and III of Taussig's forthcoming book on "The Clinical Analysis of Congenital Malformations of the Heart," to be published by the Commonwealth Fund.

ination shows a prominent pulmonary conus or when there are pulsations at the hili of the lungs. These pulsations should be looked for by careful fluoroscopic examination after one's eyes are fully accommodated.

Virtually the only malformation in which there is absence of the normal shadow cast by the pulmonary artery in the presence of adequate circulation to the lungs is complete transposition of the great vessels. In this condition the pulmonary artery lies behind the aorta; therefore, in the anteroposterior view there is a narrow aortic shadow and a concave curve at the base of the heart to the left of the sternum. In the left anterior oblique position the two vessels lie side by side; hence the shadow cast by the great vessels increases in width [20] and the pulmonary window is not abnormally clear. The condition does not cause pulsation at the hili of the lungs but frequently leads to congestion in the lung fields. These observations, together with evidence of relatively rapid progressive cardiac enlargement,[2] should aid in the establishment of the correct diagnosis.

The operation should be performed on the right or left side, depending on which vessel is to be used and on which side the aorta descends. Furthermore, it is important to bear in mind that the occurrence of a right aortic arch is by no means rare in congenital malformations of the heart which cause persistent cyanosis. Bedford and Parkinson [21] have shown that the determination of the course of the aorta is not difficult, provided fluoroscopy is carefully performed and the esophagus delineated with a barium opaque mixture. Normally the aortic knob is visible on the left, the esophagus lies in the midline and is indented by the aorta on the left margin, and in the right anterior oblique position the esophagus is seen to be slightly displaced backward by the aorta. In cases of a right aortic arch the aortic knob frequently is hidden within the shadow cast by the superior vena cava. In the anteroposterior view the esophagus is indented on the right and is displaced backward in the left anterior oblique position.

It remains to be seen whether these patients will develop heart failure. Even if this occurs, the intervening period appears to be one of great clinical improvement. It may well be that, if more patients with congenital malformations of the heart survive, more will develop subacute bacterial endocarditis. Certain it is that there is nothing in persistent cyanosis which renders an individual immune from subacute bacterial endocarditis. The condition is less frequently encountered in cyanotic persons only because a comparatively small number of patients survive long enough to be liable to contract the disease. The fear of subacute bacterial endocarditis in the future is no justification for allowing a patient to die of anoxemia in the present. Even the possibility of future cardiac failure does not weigh heavily against present extreme incapacity and the danger of early death from anoxemia or cerebral thrombosis.

SUMMARY

An operation for increasing the flow of blood through the lungs and thereby reducing the cyanosis in patients with congenital malformations of the heart consists in making an anastomosis between a branch of the aorta and one of the pulmonary arteries; in other words, the creation of an artificial ductus arteriosus. Thus far the procedure has been carried out on only 3 children, each of whom had a severe degree of anoxemia. Clinical evidence of improvement has been striking and includes a pronounced decrease in the intensity of the cyanosis, a decrease in dyspnea and an increase in tolerance to exercise. In the 2 cases in which such laboratory studies were performed there has been a decline in the red blood cell count, in the hemoglobin and in the hematocrit reading, an increase in the oxygen content of the arterial blood, a fall in the oxygen capacity, and most significantly a decided rise in the oxygen saturation of the arterial blood.

The types of abnormalities which should be benefited by this operation are the tetralogy of Fallot, pulmonary atresia with or without dextroposition of the aorta and with or without defective development of the right ventricle, a truncus arteriosus with bronchial arteries, and a single ventricle with a rudimentary outlet chamber in which the pulmonary artery is diminutive in size. The operation is indicated only when there is clinical and radiologic evidence of a decrease in the pulmonary blood flow. The operation is not indicated in cases of complete transposition of the great vessels or in the so-called "tetralogy of Fallot of the Eisenmenger type," and probably not in aortic atresia. It must be emphasized that the operation should not be performed when studies reveal a prominent pulmonary conus or pulsations at the hili of the lungs.

20. Taussig, H. B.: Complete Transposition of the Great Vessels, Am. Heart J. **16**: 728-733, 1938.
21. Bedford, D. E., and Parkinson, J.: Right-Sided Aortic Arch, Brit. J. Radiol. **9**: 776-798, 1936.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following article. HOWARD A. CARTER, *Secretary.*

THERAPEUTIC AND REMEDIAL EXERCISES

FRANK H. EWERHARDT, M.D.
ST. LOUIS

It is my purpose to confine myself to the practical application of physical exercise as related to the health of the human body rather than to discuss problems involved in the physiology of exercise.[1]

Almost all of the bodily movements done by a normal person throughout the day's routine, such as sitting, walking, eating and dressing, consist essentially of a successive recurrence of simple reflex acts. However, the matter of learning new movements has an entirely different significance and involves a review of the phenomenon of muscular control. It is interesting to syllogize on the subject of what happens when a boy learns to swim, a girl to knit or an athlete to pole vault. The answer is found in an understanding of the classification, action and coordination of muscles.

Skeletal muscles are classified as prime movers (protagonists or agonists), antagonists and synergists or fixers.

1. For studies on the physiology of exercise the reader is referred to Lipovetz (Applied Physiology of Exercise, Minneapolis, Burgess Publishing Company), who concisely interprets studies on the phenomenon of muscle contractions; the chemical changes of contraction; the phenomenon of muscular action, control and movement; equilibrium, postural tonus and tonus reflexes; nerve mechanism of the heart; innervation and chemistry of respiration, and the localization of brain function and the process of learning.

Prime movers (protagonists, agonists) are the muscles which actually produce an intended movement. The antagonists are those which tend to oppose the action of the prime movers. The synergists so modify the action of the first two that the intended movement is performed smoothly, free from shocks or jolts and with the least expenditure of energy. Without collaboration of these various groups the apparently simple act of bringing a glass of water to the mouth would indeed be awkward and conceivably impossible, much as the infant finds it difficult to convey a spoonful of food into his mouth.

Still another motivating force which contributes smoothness and grace in the process of performing an active exercise is the process of relaxation. Whenever a group of muscles contract normally, the respective antagonists are made to relax at the same time. Thus, when the elbow flexors are made to contract, causing flexion of the elbow, the movement is accompanied by a relaxation of the normal muscle tone of the extensors. This is a positive and not a negative action, known as Sherrington's law of reciprocal innervation.

Muscular activity falls into two main divisions, active and passive. The raising of a patient's arm in abduction is an active movement if performed by the sole efforts of the patient himself; it is a passive movement if applied by the assistant to the patient without the latter offering any assistance or resistance. The active group is further subdivided into various minor groups.

Active, voluntary purposeful movements are initiated by mental processes. They affect the upper and lower neurons, the motor and sensory nerves, the myoneural junction and the muscle itself. Neither passive movements nor muscular action initiated by an electrical impulse can so exclusively and favorably influence the neuromuscular arc. This intricate mechanism is so complete that when the command for movement is given by the brain cells there is always a clear mental picture of the intended movement. For a movement impulse to express itself, it must be controlled by the sensory nerves, for the will and the sensibility are functions inseparably connected with each other. Because of this intimate relationship between brain and muscle, voluntary purposeful movements are of vital importance in restoring various nerve-muscle disturbances to normal.

Occupational therapy permits and may augment active exercise. Skills and crafts can be taught and learned by the use of hands and legs. In this manner function can be more quickly restored by the patient continually repeating the desired active movements. By this means the monotony of a routine gymnastic exercise is avoided by appealing to the creative instinct of the patient. Patients with little or no interest in life may be stimulated frequently to an entirely different outlook by this form of active exercise.

Passive movements are performed by an operator without the assistance or resistance of the patient. This action must not be confused with manipulation of a joint limited in motion due to fibrous adhesions of extracapsular or intracapsular origin. Neither should it be recognized as a synonym for the term relaxing movements, since passive movements are in no way concerned in releasing tension of muscular tissue. Passive is a descriptive term meaning the opposite of active. In passive movements the sensory association motor neuron synapse is in no way involved, whereas this unit is definitely and vitally concerned in the phenomenon of relaxation.

The significance of passive movement will be more fully appreciated by noting its practical application in physical medicine:

(*a*) To be used preliminary to active movement when the latter may be harmful; i. e., in the treatment of fractures or when active movements may be harmful or actually impossible.

(*b*) To improve the return lymph and blood circulation by virtue of compression and joint motion.

(*c*) To retain full amplitude of joint motion by the prevention of contractures, shortening of muscles and the formation of adhesions.

(*d*) To maintain conscious proprioception.

(*e*) To maintain nerve power by stimulation through stretching and shortening of muscles.

Resistive movements are those in the course of which the technician resists the efforts of the patient, or vice versa. The technician offers just as much resistance as the patient is able to overcome. In certain pathologic conditions these movements have distinct advantages over the active voluntary type of exercise.

(*a*) Single muscles or groups of muscles can be caused to function to an optimal degree because of a more complete relaxation of the prime movers and a consequent lessened resistance. This phenomenon is due to the operation of Sherrington's law of reciprocal innervation. The technician resists to a degree permitting the greatest range of motion [page 26 (*a*) resistive movements].

(*b*) By the same token protective spasm may be lessened. For example, resistance to knee flexion relaxes the overactive quadriceps.

(*c*) The work done by the muscles can be graduated to any amount desirable.

(*d*) By virtue of *a* and *c* resistive movements offer an excellent method of studying muscular action and relative strength.

Assistive movements, as the name implies, are useful in supplementing voluntary effort where normal muscle power is deficient. For example, a patient with a weak deltoid in the supine position is asked to bring the arm to a 90 degree abduction.

During the range of motion, assistance is offered by the technician for the first and third part of the movement while the patient alone performs during the second part.

Isometric muscular contraction currently has been unsatisfactorily termed "muscle setting." The muscle is contracted but does not involve joint action. It is admirably adapted to conditions of fracture or joint injury to arm or leg. Though the patient's leg may be encased in a plaster cast, still he is able to carry on muscular contractions, thus improving the circulation and the muscle tone.

AIDS IN MUSCLE TRAINING

In treating weak muscles by means of active exercise there is always a danger of overtaxing and causing exhaustion which would hinder the progress of the recovery. So as to minimize this danger it has been found helpful to employ certain procedures with an aim to lessen the factors of gravity and friction. I

will mention those commonly employed, which in turn may suggest others to the reader:

(*a*) *Postural.*—The aim is to place the body in a favorable position, thereby eliminating gravity to a greater or lesser extent. For example, in treating a weak deltoid muscle the patient is placed on his back with the arm to the side resting on a smooth board covered with talcum powder. The arm may then be brought to a 90 degree angle, which the patient could not do in a standing position without a severe strain on the deltoid muscle. Similarly in treating a leg the heel may be placed on a roller skate, a piece of board with gliders underneath or a thin rubber sponge. The patient is now able to abduct and adduct the leg and flex the knee, gravity having been eliminated and friction having been reduced to a minimum.

(*b*) *Sling Suspension.*—Still another method is to suspend the extremity in a sling about 6 inches from the bed or table, thus removing the element of gravity. Again in this position the leg may be abducted and adducted and the knee flexed with comparative ease and without straining the muscles involved. In my experience I have found it helpful to attach to the lower end of the sling a 1 inch band of inner tubing, which gives opportunity for increased amplitude of motion. It also adds the element of resistance, which is desirable.

(*c*) *Underwater Exercises.*—These movements are performed in therapeutic pools or a tank constructed for home use.[2] Exercise in the pool must not be confused with swimming. It is useful because the buoyancy of the water lessens gravity and makes possible the application of therapeutic exercise.

(*d*) *Muscle Testing.*—In preparing a plan of muscle reeducation it becomes essential (*a*) to learn to what extent the muscles have been damaged in order to ascertain their capacity for work and (*b*) to keep in mind certain characteristic muscle reactions. As an aid to the former the following classification of muscles may be used or modified by giving each group a numerical value:

1. A normal muscle: patient can overcome gravity and resistance.
2. A good muscle: patient can overcome gravity and resistance, but less than normal.
3. A fair muscle: patient can overcome gravity only.
4. A poor muscle: patient can produce movement only with gravity eliminated.
5. A trace: contraction of muscle can be palpated but with only little or no motion.
6. Gone or total paralysis: no contraction felt.

Once the strength of a given group of muscles has been found and properly grouped, the selection and execution of correct remedial movements should be governed by well known principles of muscle action. A muscle group in need of strengthening should not be called on to perform its maximum load at the beginning of training; the capacity for work is greater if at no time the muscle is pushed to its limit; it is more desirable to exercise often for short periods rather than a few times for long periods.

Since it is of great importance to guard against exhaustion, special attention should be focused on the following precepts: Exercise may be carried to the point of fatigue, but not beyond; the greater the frequency of contraction, the more rapid the approach of fatigue; the more complete the exhaustion, mental or muscular, the longer the period necessary for recovery; and the more complex the discriminations required in a performance, the more rapid the onset of fatigue.

600 South Kingshighway Boulevard.

2. The Council on Physical Medicine will send free directions for the construction of a tank. Handbook of Physical Medicine, American Medical Association, 535 North Dearborn Street, Chicago.

Council on Foods and Nutrition

OCTOBER 1944 MEETING OF THE COUNCIL ON FOODS AND NUTRITION

The meeting of the Council on Foods and Nutrition was held in Chicago on Oct. 22, 1944 and was attended by the following members:

Dr. George R. Cowgill	Dr. Irvine McQuarrie
Dr. C. A. Elvehjem	Dr. Lydia Roberts
Dr. Philip C. Jeans	Dr. Russell M. Wilder
Mr. Culver S. Ladd	Colonel John B. Youmans
Dr. James McLester, Chairman	Dr. George K. Anderson, Secretary

In addition to members of the headquarters staff there were present as invited guests Dr. E. M. Nelson of the Food and Drug Administration and Dr. Donald A. Wallace, secretary of the Council on Dental Therapeutics of the American Dental Association. Two members of the Council, Dr. Morris Fishbein and Dr. Howard B. Lewis, were unable to be present.

Among the numerous topics which were discussed at the meeting, the following may be of interest to physicians, manufacturers and others:

Nutritional Aspects of Candy Advertising.—Considerable time was devoted to discussion of the question of candy advertising in publications of the American Medical Association. Advice will be given the Advertising Committee for its guidance in passing on the suitability of the nutritional statements of the candy advertising.

Suggestions were made for revisions in the so-called "Nutritional Platform for Candy." It was the opinion of the Council that the primary purpose of developing a nutritional story in candy advertising should be the education of the public in the judicious use of candy as a food substance rather than to increase the overall consumption of candy. It was felt that recommendations for the use of candy by young children can only be detrimental to their proper nutrition.

Food Comparisons in Advertising.—A technic which has been frequently used in the advertising of certain foods is the comparison of their nutritive values with several other types of foods. This method can be informative and educational or may be misleading to the reader, depending on the manner in which the material is presented. In some cases the impression may be gained that the advertised food supplies all the food values of the foods shown. This is highly undesirable. The Council was of the opinion that the practice of making comparisons in food advertising in general could not be considered desirable. If this type of advertising is used it should not give a misleading impression to the reader, and the comparisons made should not be derogatory to other good foods.

Vitamin A Content of Margarine and Butter.—The Council was informed of the recently determined average values for vitamin A content of winter and summer butters throughout the country. Other figures given by the Committee on Food Composition of the National Research Council show a vitamin A content of 10,000 U. S. P. units per pound for winter butter and 18,000 units per pound for summer butter. All of these figures are higher than previously determined values for butter and higher than the 9,000 units of vitamin A added to each pound of oleomargarine. This newer information on the vitamin A content of butter is of considerable interest because the minimum level of addition to margarine was set by the Food and Drug Administration to approximate that of average butter. The question was raised as to whether it would be advisable to encourage the addition of higher levels of vitamin A to margarine by extending use of the Council Seal to margarines fortified with 15,000 units of vitamin A, the equivalent of the year round average for butter. This was not considered advisable at the present time.

Under existing standards the fortification of oleomargarine with vitamin A is entirely optional. The almost universal fortification of table margarines with vitamin A by manufacturers at present is very commendable. It is felt, however, that provision should be made for the continued fortification of all margarine, since its nutritional value is dependent on an appro-

priate vitamin A content. With this objective a resolution was adopted urging that all margarine contain not less than 9,000 units of vitamin A per pound and that the Food and Drug Administration be requested to hold a hearing for the purpose of considering a proposal to have the present optional fortification of margarine with vitamin A be made a part of the standards of identity and of quality for margarine.

Vitamin A Addition to Milk.—This subject was discussed at the previous meeting and the conclusion reached that fortification of winter milk with vitamin A was not indicated in the interests of the public health. Instead, it was felt, encouragement should be given to those concerned with improving dairy feeding for the purpose of raising the vitamin A content of the milk. There has been some comment since the earlier meeting on the practicability of raising the vitamin A content of milk by improved feeding. It appears that improvement may not be possible to the degree or extent that was suggested earlier. This fact does not alter the position taken by the Council, which reaffirmed its original decision that fortification of winter milk with vitamin A is not necessary from the public health point of view.

Acceptability of Foods with High Natural Vitamin C Content.—Citrus and tomato juices are important dietary sources of vitamin C, and the Council has encouraged their use for the contribution of this vitamin which they make to the diet. Many such canned juices carried the Seal of Acceptance until the limitation of scope to special purpose foods excluded them from consideration. Numerous studies of canned tomato juice have shown a wide variation in values for vitamin C. This is attributed to differences in variety grown, climatic conditions and efficiency in processing methods. At present it is impossible for the consumer to determine the quality of canned tomato juice with respect to vitamin C.

It is the desire of the Council to encourage the marketing of high quality natural foods. This can be done in part by granting acceptance to products which meet high standards set by the Council. Tomato juice was selected as a food in which improvement should be sought by considering granting the Seal of Acceptance to brands which meet a high standard of vitamin C content. The value which was determined on as representing a high natural level was 20 mg. of vitamin C per hundred cubic centimeters. It was decided that this information should be communicated to manufacturers to secure their interest in the proposed program as well as their comments. At the same time a committee of the Council was appointed to work out the details of control necessary to insure that accepted brands meet the standards as well as to give consideration to the application of this policy to citrus juices and other foods.

Resolution for Continuance of Baked Goods Enrichment.—The Council has long been on record in favor of the enrichment of flour and baked goods and has done much to extend this practice. At the present time by order of the War Food Administration all white bread and rolls are enriched, but this requirement is effective only for the duration of the present emergency. Attention is now directed by those interested in providing for the continuance of these nutritional benefits to measures which will assure the perpetuation of enrichment. This can be accomplished by means of legislation in each of the individual states or through adoption of federal standards requiring enrichment. A combination of the two procedures may be the most effective.

To encourage action by the proper federal and state agencies the Council adopted a resolution urging that all white bread offered for sale contain the required quantities of enriching ingredients. It was further resolved that the Food and Drug Administration be requested to hold a hearing to consider a proposal that the present and proposed standards for bread, white bread, enriched bread and enriched white bread under the Federal Food, Drug and Cosmetic Act be merged and recognized as synonymous. At the same time it was recommended that state legislatures, particularly those not now requiring or authorizing recognition of federal food standards, enact legislation to accomplish the desired purpose within their boundaries.

Use of the Term "Pure" in Relation to Evaporated Milk.—It has been the declared policy of the Council to permit use of the term "pure" on labels or in advertising of only those accepted products for which definite standards of purity exist and when the product has been demonstrated to meet these standards. Permission has been sought for use of this descriptive term in connection with evaporated milk manufactured under the sanitary code of the Evaporated Milk Association. Opinions as to adequacy of the requirements of the code for serving as standards of purity for evaporated milk were presented to the Council. Since there was lack of agreement concerning the acceptability of the controls of the sanitary code as suitable standards of purity, the proposal that the word "pure" be permitted was not adopted. It was decided that the matter be held over for further study.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its actions will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

STAPHYLOCOCCUS TOXOID-VACCINE MIXTURE.—A mixture containing in each cubic centimeter 2,000 million killed Staphylococcus aureus and the staphylococcus toxoid derived from 1,000 necrotizing doses of toxin.

Actions and Uses.—Staphylococcus toxoid-vaccine mixture is used in infections of recognized staphylococcic etiology. Such a mixture has been offered to neutralize the toxin and lysis of the invading organism. Local reactions may follow injection.

Dosage.—Ten doses, the first dose being 0.1 cc. (200 million Staphylococcus aureus, staphylococcus toxoid 100 necrotizing doses), the tenth 1.0 cc. Each dose is increased by 0.1 cc. The agent is given subcutaneously at weekly intervals.

THE NATIONAL DRUG CO., PHILADELPHIA

Vatox Staphylococcus Toxoid-Vaccine: 6 cc. vials. Preserved with merthiolate 1:10,000.

PENICILLIN (See Supplement to New and Nonofficial Remedies, 1944, p. 18).

The following dosage forms have been accepted:

MERCK & CO., INC., RAHWAY, N. J.

Penicillin (Calcium Salt): 100,000 Oxford Unit vials.

Penicillin (Sodium Salt): 100,000 Oxford Unit vials.

THE WM. S. MERRELL CO., CINCINNATI

Penicillin Sodium: 100,000 Oxford Units.

ELI LILLY & CO., INDIANAPOLIS

Penicillin (Calcium Salt): 100,000 Oxford Unit ampuls.

CHAS. PFIZER & CO., INC., BROOKLYN

Penicillin (Sodium): 100,000 Oxford Unit bottles.

BACTERIAL VACCINE MADE FROM THE CHOLERA VIBRIO (CHOLERA VACCINE) (See New and Nonofficial Remedies, 1944, p. 568).

The following dosage form has been accepted:

ELI LILLY & CO., INDIANAPOLIS

Cholera Vaccine: 20 cc. vial. Each cubic centimeter contains 8,000 million killed cholera vibrios.

BOTULISM ANTITOXIN (See New and Nonofficial Remedies, 1944, p. 536).

The following dosage form has been accepted:

LEDERLE LABORATORIES, INC., NEW YORK

Botulism Antitoxin Bivalent Globulin Modified: Vial containing 10,000 units each of type A and type B botulism antitoxin. Preserved with phenol 0.4 per cent and 1:25,000 phenylmercuric borate.

NIKETHAMIDE (See New and Nonofficial Remedies, 1944, p. 330).

The following dosage form has been accepted:

CARROLL DUNHAM SMITH PHARMACAL CO., ORANGE, N. J.

Solution Nikethamide 25% W/V: 15 cc. vials.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MAY 19, 1945

THE RETURNING MEDICAL OFFICER

Under Medicine and the War in this issue of The Journal appears a message from Surgeon General Norman T. Kirk indicating that it will be the policy of the Army Medical Department to bring back to the United States medical officers relieved from service in the European theater of operations and to assign them on their return, as long as needed, to service in their specialties in American hospitals and other installations. Medical officers who have not had foreign service and who are found fit for service abroad will be assigned as needed to foreign theaters of operations. This information will answer the questions of many medical officers, some of whom have written and telegraphed to the headquarters of the American Medical Association asking for a definite statement on this subject.

Many physicians have also written to the American Medical Association protesting against the possibility that they may be assigned on their release from service with the armed forces to the Veterans Administration. These letters were brought before the Committee on Postwar Medical Service at its meeting in Chicago May 12. That committee took prompt action, adopting the following statement, which was sent to the Secretary of War, Secretary of the Navy and the Committees on Military Affairs of the House of Representatives and the Senate:

In November 1944 the Army Medical Department was directed to transfer at least 300 medical corps officers to the Veterans Administration, this number to include those officers in the zone of the interior who were formerly employed by the Veterans Administration as civilians. Apparently about 100 men meeting the latter classification were so assigned and in addition some 200 others selected largely from among men who had been marked "limited service." Many of those thus assigned have protested and others are now protesting bitterly against these assignments on the ground that their enlistment was distinctly for military service and that assignment to the Veterans Administration cannot be thus characterized. Many physicians who have served with distinction in both the European and the Pacific theaters of operation are now indicating by communications addressed to the headquarters of the American Medical Association the fear that they may be assigned on their return to the United States to service with the Veterans Administration. The unwillingness to serve with the Veterans Administration is based not only on their belief that this cannot be considered military service but also on the point of view that competent, scientific medical care is difficult under the conditions that prevail in the veterans' hospitals.

The Committee on Postwar Medical Service, which includes representatives of the American Medical Association, the American College of Surgeons, the American College of Physicians, the American Hospital Association, the Federation of State Medical Licensing Boards, the Association of American Medical Colleges, the Catholic Hospital Association, the Advisory Board for Medical Specialties and many other groups, after careful consideration of the problems involved urges that the Secretary of War, the Secretary of the Navy and all others concerned with the activities of physicians voluntarily enlisted in the armed forces recognize the righteousness of the protests made by these medical officers against assignment to the Veterans Administration. It is further urged that the needs of the Veterans Administration for physicians be met either by voluntary enrolment of men in the armed forces at the time of their release from the service or by recruitment of medical personnel from civilian sources.

The American Medical Association—and this statement is made wholly in explanation of a fact that should be obvious to every one—does not have authority to determine in any way the assignments of physicians in the armed forces. The officers of the Association would be hesitant to interfere in the making of decisions as to the assignments or transfer of men in the armed forces. The decisions as to how military personnel are to be utilized must rest with those who carry the responsibility for the ultimate results. This statement is made because many a medical officer has written to the headquarters of the American Medical Association actually demanding that the Association exert its influence to determine the decisions, not only of those responsible for the medical departments of the armed forces, but even of the Secretaries of War and Navy, of the Committees on Military Affairs of the legislative bodies and even of the President. The Board of Trustees and the officers of the Association have felt keenly, nevertheless, the responsibility that rests on them to present to those in authority the facts that should be given serious consideration in the making of decisions concerning medical personnel.

Unfortunately, steps have not yet been taken by the Selective Service System for a continuing supply of physicians for the future. The medical schools are confronted at this moment with an insufficient number of men to fill their freshman classes in the years immediately to come. The Committee on Military Affairs of the Senate, having given serious and extended hearings to the Ellender bill, has failed to issue a statement of its reaction to that proposal. The time may yet come when those with the authority and the responsibility will have to answer to the people of the United States for a critical situation in the supply of medical service.

NUTRITIONAL EDEMA

A characteristic edema appears widespread during war and famine. This war is not an exception. None of the usual designations, as famine edema, war edema, hunger edema and nutritional edema, express adequately the nature of the disease. Until recently biochemical and nutritional knowledge has been inadequate to determine a more specific cause than nutritional deficiency.

The relationship of lowered blood protein to the development of edema was pointed out by Starling in 1896; the protein factor has received increasing attention in the last decade. Edema from lack of thiamine occurs in the wet type of beriberi. One or both of these factors may be involved in the development of the edema observed during famine.

In some persons with this edema the serum protein was determined [1] and an average value of 5.39 per cent was found, compared with 8.07 for the normal or average. Other reports describe only the presence of edema and the effect of various therapeutic agents in causing it to disappear or body weight to decrease. The efficacy of high protein foods in raising the serum protein values and in causing the edema to disappear is generally acknowledged. Casein and soy flour in amounts of 150 and 300 Gm. respectively added to a standard 1,700 calory diet were found effective in causing edema to disappear.[2] The addition of 2.5 liters of milk to the daily diet of 11 patients resulted in some recoveries. Vallejo successfully treated cases of malnutrition edema with the addition of 1.5 liters of milk daily to a 1,900 calory diet containing 35 Gm. of protein. The addition of butter to the basic diet was helpful in relieving edema; the authors attribute this effect to the protein sparing action of this fat. Investigators who study these patients caution against the relapse that often occurs if treatment with protein is discontinued soon after the edema is lost. This observation supports the concept that lowered serum proteins indicate a depletion of protein reserves of the body which must be restored before cure can be effected.

The results of attempts to relieve nutritional edema by administration of vitamins of the B complex are conflicting. Several workers report that improvement of the edema does not follow the use of parenteral injections of as much as 75 mg. of thiamine or 1 Gm. of niacin daily for ten days.[2] Crismer [3] found that the urinary excretion of thiamine in 6 patients with hunger edema was the same as that of healthy persons with normal thiamine excretion after saturation tests. Such symptoms of thiamine deficiency as numbness and paresthesias were usually absent. In contrast are the reports of Simonart,[4] in which the claim that thiamine is effective in relieving the edema and has an influence on the protein level of the blood is made repeatedly. Some of the experiments of this investigator are complicated by the fact that the brewers' yeast used as a source of thiamine is a good source of high quality protein as well. The preponderance of evidence points to the dominant role of protein in the etiology of this type of edema.

Opportunity is afforded in the rehabilitation of European countries to study this problem further. The final answer will establish the part played by each of the nutritional factors. When the causative relationship has been determined satisfactorily this condition may be designated by a term which describes the nutritional state accurately.

1. Raynaud, M., and Laroche, C.: Compt. rend. Soc. de biol. **137:** 216 (April) 1943.
2. Gounelle, H.; Bachet, M., and Marche, J.: Bull. et mém. Soc. méd. d. hôp. de Paris, Oct. 16, 1942, p. 349.
3. Chrismer, R.: Scalpel **94:** 1289, 1941.
4. Simonart, E. F.: Acta biologica Belg. **4:** 537; Scalpel, Dec. 20, 1941; Jan. 30, 1942.

EPIDEMIOLOGICAL INFORMATION BULLETIN OF THE UNRRA

The Council of the United Nations Relief and Rehabilitation Administration recommended in November 1943 that government and recognized national authorities cooperate fully with the administration in establishing, at the earliest possible date, regional and other emergency agreements and arrangements for the notification, within the limits of military security, of diseases likely to become epidemic, uniformity in quarantine regulations and for other measures of prevention. An Expert Commission on Quarantine was appointed by the Standing Technical Subcommittee on Health for Europe on May 12, 1944 with instructions to draft, for consideration by the Subcommittee on Health, international sanitary agreements of an emergency nature designed to take effect at the earliest possible date and to continue through the immediate postwar period. The two principal existing international treaties relating to quarantine were the International Sanitary Convention, signed at Paris in 1926, and the International Sanitary Convention for Aerial Navigation, signed at The Hague in 1933. After studying the existing conventions and the modifications required to make them conform to the conditions arising from the war, the commission realized that such modifications should also be applied worldwide if they were to be effective. The commission submitted to the Standing Technical Subcommittee on Health for Europe, at its meeting on May 19, 1944 two drafts with an explanatory memorandum for the modification of the International Sanitary Convention, 1926, and the International Sanitary Convention for Aerial Navigation, 1933. Each draft provided that UNRRA would carry out the duties and functions assigned to the International Office of Public Health, Paris, without prejudice to the future status of that body. To give greater amplitude to the amended conventions, governments would notify, in addition to the diseases specifically mentioned in the previous conventions, namely plague, cholera, yellow fever, typhus and small-

pox, other communicable diseases which, in the opinion of UNRRA, constitute a menace to other countries, and would keep the administration regularly informed of the course of the epidemic. In turn, UNRRA would promptly inform all participating governments of the outbreak of any disease which, in its opinion, constitutes a menace to other countries and of the measures which are being taken to prevent the spread of the disease across frontiers.

In January 1945, when the Health Division of UNRRA was entrusted with the execution of the amended international sanitary conventions, the director general of UNRRA requested that the staff of the Health Research Unit of the League of Nations be released for transfer to the UNRRA's Health Division in order to form the nucleus of its epidemiologic information service to be organized within the section of epidemic control. The *Epidemiological Information Bulletin* is to be the medium of information to those concerned. Its first few issues, according to Wilbur A. Sawyer, director of health, will consist pricipally of the authentic texts of the new and amended sanitary conventions. Subsequently the statistical material will be regularly presented and space will be given to reports on epidemic control activities in which UNRRA may be taking part, to certain reports and resolutions of the Standing Technical Committee on Health and its Expert Commission on Quarantine, and to such items of news as may have special bearing on international health.

The *Epidemiological Information Bulletin* will serve to bring about more effective and intimate collaboration between nations in control of disease.

Current Comment

ANTIVIVISECTIONISTS DEFEATED IN BALTIMORE

Nowadays, whenever state legislatures are in session, so-called "dog bills" are introduced through the pressures exerted by the executive secretaries of groups who call themselves antivivisectionists. These sentimentalists have adopted the dog as the symbol of their approach to an antiscientific crusade against medical research involving the use of animals. The crusade is based on the claim that research involving animals is needlessly cruel and should therefore be prohibited. Moreover, the benefits to medical science and therefore to sick human beings are said to be fictitious. Our legislators are drawn largely from nonmedical groups and are likely to be uninformed about medical research. From the antivivisectionists' point of view they are ripe for the picking. Most legislators, however, are definitely susceptible to facts when well presented. According to the Baltimore *Sun*, April 10, the city council adopted an unfavorable report of its committee on legislation with respect to a proposed ordinance which would have prohibited the use of live dogs for experimental purposes in medical schools and laboratories in the city of Baltimore. The action of the committee was adopted by the council without discussion. Previously there had been a three hour hearing in which the matter was exhaustively explored. The council chamber was filled with proponents and opponents of the ordinance. Many of Baltimore's leading physicians, including the deans of the faculties of medicine of Johns Hopkins and the University of Maryland, the city health commissioner and many others, attended. These physicians told of the use of animals and the necessity for their use in connection with much modern progress in medicine, such as establishing the dosages of the sulfonamide drugs, testing of epinephrine and the treatment of shock with plasma. The most effective testimony was the introduction of two children and the mother of a third whose lives had been saved through blood vessel surgery by Dr. Alfred Blalock of Johns Hopkins. The *Sun*, in addition to publishing a lengthy report of the council action, made it the subject of an editorial comment in its next issue, April 11. Significant statements from the editorial are the following:

> On Monday night the city council killed the proposed antivivisection ordinance. . . . In so doing the council did the intelligent thing. . . . The campaign to prohibit the use of dogs in medical experiments is particularly vicious because it appeals to unthinking sentimentality. . . . Such an ordinance as that which the council just killed would be a fearful blow to scientific research and, indeed, would stop research entirely in many lines. It is an attack on enlightenment and on the humane objectives of research. *The antivivisection movement is inhumane in the deepest sense.* . . . Baltimore is one of the world's great centers of medical research, and the men engaged in it decided to lay their case before the city council fully and frankly. Like good scientists, they placed their faith in the power of reason to convince all men of good will . . . and the council by its prompt decision fully justified their faith.
>
> Many morals might be drawn from this episode. One is that, in the defense of enlightenment, there must be a never ceasing vigilance and that no man, however remote he may feel himself from the turmoil of politics, can properly consider himself above the fight. Another is that reason—in which so many, confronted by the power of unreason in this turbulent world, seem to have lost faith—is still a shining weapon.

Baltimore is to be congratulated on this victory for reason and science over the sinister forces arrayed against medical research and the progress of medical science. The tragedy is that the fight in Baltimore will have to be made again and again before state legislatures, city councils and the Congress. Ignorance, fanaticism, false sentimentalism and cynical irresponsibility are diseases for which science has thus far failed to find a remedy, even with the use of experimentation on animals that has yielded so much good to both animals and man.

MEDICINE AND THE WAR

ARMY

CIVILIAN COMMITTEE TO AID ARMY IN REHABILITATING BLIND SOLDIERS

The War Department recently announced that, in its efforts to rehabilitate blinded soldiers of the present war, the Army will be assisted by an honorary civilian advisory committee selected by the Surgeon General from among leaders in work among the blind throughout the United States. Addition of the advisory services of this committee emphasizes the determination of the Surgeon General that no blinded soldiers of this war will be returned to their communities without maximum adjustment and aid in the resumption of a normal and useful life in their respective communities.

Services of the members of the committee will be available to Dibble General Hospital at Menlo Park, Calif., and Valley Forge General Hospital at Phoenixville, Pa., which are the medical and surgical centers for blinded servicemen, and to Old Farms Convalescent Hospital, Avon, Conn., the Army's center for rehabilitation training for blinded veterans.

Function of the committee will be to advise the Army in the technic used in civilian organizations for the blind, to offer suggestions which may be adapted to army use and to be of general assistance to those in charge of the Army's program, so that effective liaison with the civilian agencies for the blind may be maintained.

Three members of the committee, Peter J. Salmon, Brooklyn; W. L. McDaniel, Washington, D. C., and Henry Johnson, Tampa, Fla., have been appointed special consultants to the Surgeon General and will make a field survey of the Army's program for the Medical Department.

The other members of the committee are Robert B. Irwin, chairman, New York; Josef G. Cauffman, secretary, Overbrook, Pa.; Gabriel Farrell, Watertown, Mass.; Eber L. Palmer, Batavia, N. Y.; Roma S. Cheek, Raleigh, N. C.; Mrs. Lee Johnson, Jefferson City, Mo.; E. A. Baker, Toronto; Thomas J. Carroll, Newton, Mass., and Philip N. Harrison, Harrisburg, Pa.

TWO WOMEN DOCTORS ASSIGNED TO SURGEON GENERAL'S OFFICE

Among the medical officers recently assigned to the Surgeon General's Office are two women doctors, Capt. Gladys Osborne, M. C., Waynesville, N. C., and 1st Lieut. Audrey A. Bill, M. C., Wayland, Mass.

Captain Osborne is assigned to temporary duty with the Nutrition Division. She graduated from Vanderbilt University School of Medicine, Nashville, Tenn., in 1932, was commissioned in the Medical Corps in 1943 and has been a medical ward officer at Lawson General Hospital, Atlanta, Ga., and prior to her present assignment was admitting and dispensing officer and chief of the outpatient service at Foster General Hospital, Jackson, Miss.

Lieutenant Bill is assigned to the Preventive Medicine Service. She graduated from Boston University School of Medicine in 1941 and entered the service July 29, 1943. Her army assignments have included duty at the Station Hospital, Fort Devens, Mass., and Waltham Regional Hospital, Waltham, Mass., where she was in the surgical service.

EXHIBIT ART WORK CREATED BY ARMY DOCTORS

The première exhibit of more than two hundred and fifty oil paintings, water colors and sketches depicting the war role of army doctors, nurses and enlisted men of the Army Medical Department was held at the Corcoran Galleries, Washington, D. C., May 13.

The pictures are the work of several of the country's foremost artists. They make up the Army Medical Department War Art Project, which was authorized by the War Department two years ago and launched at the same time by the Surgeon General's Office. Many of the artists, who worked on the project under the direction of the Associated American Artists in New York, were sent to American battle fronts in the South Pacific, Europe and the Mediterranean. Others confined their activities to training centers in the United States and to zone of interior hospitals.

The idea for a collection of Army Medical Department war paintings was first projected in September 1942 by Lieut. Col. Howard Baer, executive officer of the Army Medical Purchasing Department Office, New York branch of the Surgeon General's Office. With the aid of his commanding officer, Col. Howard F. Currie, currently executive officer, Supply Service, Office of the Surgeon General, approval of the undertaking was obtained from Major Gen. Norman T. Kirk, Surgeon General of the United States Army, and the office of the Secretary of War. Colonel Baer was charged with the duty of propelling the project to a successful conclusion.

The project was sponsored by Abbott Laboratories. Known as the Abbott Collection of Paintings of Army Medicine, the canvases will be donated to the War Department.

The entire collection will be exhibited in several large cities. Although the exhibiting itinerary has not been completed, the collection will move from Washington to St. Louis in June. Other cities in which the pictures are scheduled for exhibition include New York, Seattle, Chicago, Cleveland, San Francisco and New Orleans.

INTRASTERNAL PLASMA SAVES CREWMAN'S LIFE

The life of a B 29 crew man was recently saved when comrades gave him blood plasma through a new type of needle. The successful injection showed that the new intrasternal method of administering plasma can be used safely by airmen. The intrasternal method is being taught to the entire crew even before they start on bombing missions, so that this method can be resorted to when the patient is suffering from shock and his veins have collapsed.

Rotation and Redeployment of Medical Officers

The policy of the War Department and of my office is that when medical officers are returned to the United States on rotation or redeployment they will be assigned to duty according to their specialties. They will replace officers with similar qualifications who have not had opportunity for foreign service.

KIRK
Office of the Surgeon General
Washington, D. C.

SANITARY CORPS OFFICER AWARDED LEGION OF MERIT

Major Joseph A. Calamari, Sn. C., was recently awarded the Legion of Merit for determining through personal investigation the causes of corrosion of stainless steel and plated carbon steel surgical instruments, both in storage and in the field, causing failure or impairing the usefulness of the instruments. As a result of the investigation, Major Calamari devised a method of prevention which will protect the maximum usefulness of surgical and dental instruments.

MEDICAL DEPARTMENT WOMEN RETURN FROM INSPECTION

The heads of the three professional women's corps of the Medical Department have recently returned from an extensive tour of inspection of hospital and nurses' facilities in the European and Mediterranean theaters of operations. Those on the trip were Col. Florence A. Blanchfield, superintendent of the Army Nurse Corps; Major Emma E. Vogel, chief of the Physio-Therapy Division, and Major Helen C. Burns, chief of the Dietetic Branch.

DENTAL CORPS OFFICER WINS AWARD

Major Victor H. Dietz, formerly of St. Louis and now in the Army Dental Corps, was recently awarded the Legion of Merit in recognition of his work in perfecting a plastic substitute for making artificial eyes.

ARMY AWARDS AND COMMENDATIONS

Colonel Benjamin J. Birk

Col. Benjamin J. Birk, formerly of Milwaukee and now surgeon of headquarters of the CCC near Kunming, China, was recently awarded the Legion of Merit "for exceptionally meritorious conduct in the performance of outstanding services." For a time before arriving in India in February 1944 Dr. Birk was commanding officer of a hospital troop ship. Flown over the Himalayan "hump" to China in April 1944, he served as medical officer with an American liaison group attached to Chinese combat forces in the fighting about Kweilin, Changsha, Henyang, Chaun Shien and Luichow in the spring, summer and early fall of 1944. Dr. Birk graduated from Rush Medical College, Chicago, in 1919 and entered the service in April 1942.

Colonel Robert S. Brua

The Legion of Merit was recently awarded to Col. Robert S. Brua, formerly of Los Angeles. According to the citation "he served as division surgeon of the Alaskan Division, Air Transport Command, from July 1943 to October 1944. With rare ability he made plans for, established and maintained a medical department that contributed in great measure to the highly successful operations carried out by the Alaskan Division. Surmounting the obstacles of climate, terrain and transportation difficulties, he established dispensaries in isolated localities and organized all medical aspects of the search and rescue work. Under his supervision the water problems which threatened the health of the personnel were effectively solved and a well coordinated system instituted for the air evacuation of the wounded and sick from the widely scattered areas." Dr. Brua graduated from Washington University School of Medicine, St. Louis, in 1931 and entered the service July 1, 1934.

Captain Shermer H. Stradley Jr.

The Legion of Merit was recently awarded to Capt. Shermer H. Stradley Jr., formerly of Wilmington, Del. The citation commends Captain Stradley for "exceptionally meritorious conduct in the performance of outstanding service in North Africa, Sicily and Italy from March 13, 1943 to Aug. 26, 1944. From the activation of the battalion he organized, trained and constantly supervised the medical detachment including regular and emergency aid men in all companies. The excellent state of general health and extremely low time lost for disease and malaria in highly infected areas kept the effective manpower of the battalion at such a high percentage that the unit was able to lead or equal all similar transportation battalions in ton-miles of essential war supplies through three different campaigns. Captain Stradley attained these results through constant study of newest methods, through personal and energetic inspection and supervision of all health and sanitary measures, by constant instruction and supervision of preventive measures, and through the building up of complete confidence in all the personnel of the battalion. His actions are in keeping with the highest traditions of the United States Medical Corps." Dr. Stradley graduated from Hahnemann Medical College and Hospital of Philadelphia in 1934 and entered the service in June 1942.

Colonel Francis J. McGowan

The Bronze Star was recently awarded to Col. Francis J. McGowan, formerly of New York, "for meritorious achievement in connection with military operations against the enemy on Leyte, Philippine Islands," and five days later he was awarded the Oak Leaf Cluster to the Bronze Star for his actions, including performance of operations under fire as a volunteer on Luzon, Philippine Islands, where he was attached as an observer with the forces commanded by Major Gen. Charles P. Hall. The Luzon citation states, in part, "Owing to a critical shortage of qualified surgeons, Colonel McGowan volunteered his services and was on four occasions assigned to different portable surgical hospitals where his services were most needed. During this entire period he was on duty extremely long hours performing many delicate and serious operations and, through his knowledge and skill, was instrumental in saving many lives. In many instances he was working very near the enemy lines and was exposed to enemy sniper, machine gun and mortar fire. His devotion to duty, his calm and efficient manner under the strain of combat and his superior surgical skill contributed in a large degree to the success of the operation and was an inspiration to his comrades. His actions were in keeping with the highest traditions of the military service." Dr. McGowan graduated from Columbia University College of Physicians and Surgeons, New York, in 1921 and entered the service Oct. 2, 1942.

Major Sylvester W. Rennie

Major Sylvester W, Rennie, formerly of Wilmington, Del., was recently commended by his commanding officer, Major Gen. R. G. Breene. The commendation read, in part, "During the evacuation of wounded troops from Guadalcanal through the 27th Station Hospital this officer displayed extraordinary ability as a surgeon and extreme resourcefulness in coping with situations which at the time, owing to limited equipment, seemed hopeless. By his untiring energy and devotion to duty he set an example for the enlisted men and was one of the four surgeons who went without rest or sleep for eighty-six hours. As a result of the cooperation and skill of this officer over 140 badly injured soldiers were given expert surgical care. Wounds of the extremities, chest and abdomen were all operated on successfully and most of these men were evacuated by troop ship to the United States for further care within seven days." Dr. Rennie graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1930 and entered the service in June 1942.

Major Robert W. Robertson

Cited many times for his performances as a surgeon at the battle front, Major Robert W. Robertson, formerly of Paducah, Ky., was recently decorated as an Honorary Officer of the Military Division of the Most Excellent Order of the British Empire. The honor came from His Majesty, the King of England, and it is the first of its kind to be presented to an American medical officer. The decoration was bestowed "in testimony of Major Robertson's outstanding performance while on duty for four and a half months as operating surgeon in a British Field Hospital at the Anzio beachhead." An appropriate ribbon was presented to Major Robertson by the com-

manding officer of the Second Auxiliary Surgical Group, in lieu of the insignia and the medal which will be presented at a later date by a high ranking British official. It was stated that King George notified General Alexander to present the medal formally when the tactical situation permits. Dr. Robertson graduated from Loyola University School of Medicine, Chicago, in 1932 and volunteered for service in September 1942.

Major Joseph M. Greene

The Purple Heart was recently awarded to Major Joseph M. Greene, formerly of Chicago, who is now somewhere in Germany attached to the 105th Evacuation Hospital, which was bombed by enemy aircraft Dec. 31, 1944. Dr. Greene graduated from Rush Medical College, Chicago, in 1927 and entered the service June 1, 1942.

MISCELLANEOUS

MILITARIZATION OF THE AMERICAN HOSPITAL IN PARIS

THEODORE C. MERRILL, M.D.
Ancien associé en médecine de l'Hôpital américain de Paris

The American Hospital in Paris on Neuilly-sur-Seine has temporarily suspended its functions as a civic hospital. At present it is governed by the military authorities of the United States as represented by Lieut. Col. Edmund O. Gates, chief medical officer. A few officials of the old régime will continue their functions alongside the personnel belonging to the Army of the United States. From now on the hospital will accept only members of the American forces.

The hospital was created in 1906 and conforms to the regulations pertaining to hospitals in France. It received its first patient on March 30, 1910 and was formally recognized in 1913 by a federal legislative decree of the United States. This first American hospital had a capacity of between 40 and 50 patients only. It rendered efficient service to the organization and work of the American Ambulance Hospital during the war of 1914-1918. After this war the necessity for an American hospital in Paris became more and more evident. A new building, commenced in 1922, was opened on Jan. 30, 1926, the inaugural ceremony having been held on May 12 of the same year. Subsequent to that date the hospital functioned in Paris until the entry of the United States into the present war. In 1941, following the departure of the American officials, the hospital was occupied by the French Red Cross and was used largely as the center of rehabilitation of the wounded, occasionally admitting a certain number of civilian patients. The hospital was incorporated to function as an American hospital in France for a term of fifty years, thirty-one of which have already elapsed. What will be its existence in the remaining nineteen years? Who knows? Perhaps it will be converted into a French hospital and perhaps its charter will be renewed and prolonged. In any case it will always be a part of the medical history of Paris.

We salute, therefore, the hospital under its new name—"Station hospital numéro 365 de l'armée des Etats-Unis" (Base Hospital No. 365 of the American Army) and wish it and its chief a future full of honor and usefulness.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Birmingham General Hospital, Van Nuys: Traumatic Surgery of the Abdomen, Dr. Charles E. Phillips and Comdr. Gaylord Bates, May 23.

U. S. Naval Hospital, Santa Margarita Ranch, Oceanside: Malingering Tests, Dr. John Mackenzie, May 24.

U. S. Naval Hospital, Corona: Tumor Pathology, Comdr. John W. Budd, May 24.

U. S. Naval Hospital, Mare Island: Uremia Following Urologic Surgery, Dr. Donald Smith, June 8; The Surgical Approaches to the Knee Joint, Dr. LeRoy C. Abbott, June 15.

Station Hospital, Fort Ord: Psychosomatic Medicine, Dr. Karl Bowman, June 2; Abdominal Surgery, Dr. Thomas F. Mullen, June 16; Injuries to the Knee Joint, Dr. Frederic C. Bost, June 23.

Station Hospital, Stockton Army Air Base: Early Ambulation of Surgical Patients, Dr. H. Glenn Bell, June 13; Diagnosis and Treatment of Arthritis, Dr. Hans Waine, June 20; Injuries to the Knee Joint, Dr. Carl E. Anderson, June 27.

Station Hospital, Camp Roberts: Severe Infections of the Hand, Dr. Edmond D. Butler, June 16; Experiences with Infectious Diseases in Army Camps in England, Dr. Gordon E. Hein, June 23.

U. S. Naval Hospital, Treasure Island: Experiences with Infectious Diseases in Army Camps in England, Dr. Gordon E. Hein, June 1.

Hammond General Hospital, Modesto: Subacute Bacterial Endocarditis, Dr. William J. Kerr, June 13.

Kansas

A. A. F. Regional Hospital, Smoky Hill Army Air Field, Salina: X-Ray Findings in Abdominal Pathology, Dr. Ira H. Lockwood, June 14; Shock Burns and Blood Derivatives, Dr. Vincent T. Williams, June 1.

New York

Station Hospital, Mitchel Field: Treatment of Thyrotoxicosis, Dr. David P. Barr, June 4; Diagnosis and Treatment of Malaria, Dr. Henry E. Meleney, June 5.

Virginia

A. A. F. Regional Hospital, Langley Field: Gastroenterology, Dr. Lay Martin, June 29; Traumatic Surgery of the Abdomen, Lieut. R. C. Wood, June 29.

West Virginia

Newton D. Baker General Hospital, Martinsburg: Chest Injuries in War, Dr. I. A. Bigger, June 4; Shock, Dr. E. I. Evans, June 4; Liver Diseases Seen in the Present War, Col. Balduin Lucke, June 18.

Wisconsin

Station Hospital, Camp McCoy: Blood Dyscrasias, Malaria, Filariasis, Dr. O. O. Meyer, May 23.

Station Hospital, Truax Field: Brain and Spinal Cord Injuries, Dr. T. C. Erickson, May 23.

ONE TON ELECTRON MICROSCOPE

Surgeon Gen. Thomas Parran of the Public Health Service recently announced that a 1 ton electron microscope, powerful enough to magnify the windpipes of mosquitoes to a size of approximately 2 inches, was recently added to the arsenal of scientific instruments for the study of cancer at the National Cancer Institute, Bethesda, Md. Although installed in the National Cancer Institute, the microscope will not be restricted to the study of cancer but will be available to other divisions of the National Institute of Health.

The microscope was built by the Radio Corporation of America at a cost of $13,000 and is the ninetieth in this country. It uses electrons instead of light rays, and magnetic fields instead of glass lenses, to peer into submicroscope worlds. It has revealed for the first time how disease-fighting organisms in the blood attack disease-producing viruses. The highly magnified photographs—or electron micrographs, as they are termed—show how the body protects itself from infantile paralysis, smallpox, influenza, the common cold, yellow fever and other diseases. These micrographs are important factors in determining the effectiveness of various methods of treatment. The machine will also enable scientists to compare diseased tissues with healthy tissues under direct magnifications of 10,000 to 75,000 diameters.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

May 14, 1945.

Week of June 2 Proclaimed National Rehabilitation Week

Although overshadowed by the announcement of VE day at the White House, a proclamation was issued by President Truman making the week of June 2 National Rehabilitation Week. It will be the twenty-fifth anniversary of the national program for rehabilitating men and women returning from the armed forces with disabilities. President Truman called on all churches, educational institutions, health and welfare services, civic organizations, chambers of commerce, industry, radio, press and the public to join in the program.

Federal Security Administrator Paul V. McNutt announced that specially arranged clinics for the examination and treatment of disabled men and women would be held throughout the country between the 2d and 8th of June. Michael J. Shortely, director of the Office of Vocational Rehabilitation of the Federal Security Administration, will unite all cooperating state agencies in the program.

Possible Replacement of General Hines

Capital Hill sources say that President Truman may dismiss 66 year old Brig. Gen. Frank T. Hines as Veterans Administrator and replace him with his former Missouri Senate colleague Bennett Champ Clark, a veteran and former commander of the American Legion. Furthermore, Mrs. Edith Nourse Rogers, Republican of Massachusetts, ranking Republican on Representative John Rankin's House Veterans Committee, says that President Truman is "definitely interested" in her bill to create a new Department of Veterans Affairs, headed by a Secretary of Veterans Affairs in the cabinet. General Hines meanwhile has stated that the problem in veterans' hospitals today is not beds but personnel. He states that 1,000 more beds could be added if 100 more nurses could be found.

Medical Testimony Against Animal Experiments Sought

Representative Lemke, Republican of North Dakota, sponsor of the Lemke bill prohibiting experiments on live dogs or other animals in Washington, is seeking personal testimony or written statements against animal experiments from leading medical men. He revealed that hearings scheduled before a House District subcommittee have been deferred to about May 20 to enable him to get this testimony. Expressing confidence that the House will enact the legislation during this session, Representative Lemke said "Our witnesses, many of them among the best known practitioners in the nation, will show that most of the claims made for the scientific value of experiments on animals are baseless and unverified."

Studies in United States by Brazilian Health Official

Enrique Da Rocha Lima, superintendent of the Biologic Institute of São Paulo, stated on his arrival here from Rio de Janiero on invitation of the Department of State that he will make a thorough study of prevention and cure of typhoid and malaria. He will attend classes at Columbia University in New York and other colleges in the North and East. He will study animal and plant diseases at the Department of Agriculture in Washington. The Brazilian government, he said, is concentrating on a campaign against spread of all tropical diseases.

Probe of Government Spending for Research

Senator Homer Ferguson, Republican of Michigan, has started a one man investigation to determine whether government spending for research is justified. As a member of the Senate Appropriations Committee he wishes to know how much is being spent, whether there is waste or overlapping, and whether people are getting value for money spent. He found on checking through committee files a total government research budget of more than half a billion dollars. "I don't want to do anything to stand in the way of developing the most modern and efficient implements of war for the protection of our armed forces and the nation as a whole, but I think it's time to take stock of what we are doing" he said.

Doctors Maintain Health Despite Shortages

The District of Columbia Medical Society reports from a survey covering the period from Sept. 1, 1942 to April 1, 1945 that, despite a wartime decrease in private physicians, the remaining doctors are capably serving all patients and could meet an epidemic with the aid of hospital staffs and medical students. The survey was prepared by auditors of the U. S. Public Health Service in cooperation with the medical society for the Procurement and Assignment Service of the War Manpower Commission. The survey showed that the number of private practitioners dropped from 991 to 910 and the segment of population assigned to each rose from 934 to 1,018 in the city and 1,250 in the area. The present potential load is said to be closer to 1,400 at this date. One doctor in 1,250 was said to be the top desirable load but that through an increased effort on the part of practitioners the situation had been handled adequately. Dr. George C. Ruhland, District health officer, said that the general health seems to have increased rather than decreased in the capital.

Russian Hospitals for Amputee Cases

Russian War Relief, Inc., reports that it is spending more than $1,000,000 to equip a system of hospitals in the Soviet Union to handle amputation cases. The organization, an agency in the National War Fund, intends to equip four regional hospitals in different sections of the Soviet Union with artificial limb workshops where final fittings will be made. Dr. Vladimir D. Chaklin, director of the Prosthetics Institute of Moscow, has been in this country for the past five months consulting with American physicians and manufacturers of artificial limbs.

Improved Medical Aid for War with Japan

Experience of medical officers in the European theater will benefit work of service physicians and surgeons in the war against the Japs, it is revealed here. Besides improvements in battle technic, better equipment will be available. Two examples: The Medical Corps has built special portable dental units that can be used as operating rooms, and sterilization units that can be converted into a heating plant large enough to keep a whole hospital warm.

Capital Notes

Although the Catholic clergy have opposed the proposal to legalize sterilization of mental defectives in the District of Columbia, Rev. Edward Oliver Clark, Baptist, has urged in a letter that District commissioners proceed to draft legislation.

More than 200 representatives of five sponsoring groups attended the dedication of the new mental hygiene bureau of the District of Columbia and welcomed its new director, Dr. John F. Owen.

The annual report of the District Social Hygiene Society recommends revision and strengthening of District health regulations to combat venereal diseases now and during the postwar period.

Optometrists have been added to the "health and welfare services" group of industries considered "essential" to the war effort by the War Manpower Commission. Also included was the manufacture of supplies used by morticians.

Agricultural activity is reported by the Veterans Administration to be among the most valuable forms of occupational therapy for certain types of psychotic patients.

Typical of the national trend, deaths from tuberculosis have declined 10 per hundred thousand of population since 1941, Dr. A. Barklie Coulter, chief of the District health department tuberculosis bureau, reports.

The Census Bureau estimates that 7 out of every 100 babies born in the United States last year were unregistered.

The Foreign Economic Administration reports that 16,000 pounds of amigen, a protein substance, was flown from the United States to prevent death for 80,000 persons in the Netherlands, so near starvation that they cannot digest ordinary food.

Isolation cells of the Industrial Home School for children are comparable to conditions in German "horror camps," according to investigators. Representative John M. Coffee, Democrat of Washington, has threatened to send his own investigators to report on conditions in Capital institutions for children.

The District Commissioners have sent to Congress a draft of proposed legislation which would give the District health officer authority to remove and detain by force any recalcitrant carrier of a communicable disease.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Selective Training and Service Act

The House of Representatives has passed H. R. 1812, authorizing the award of a certificate and a medal for faithful service to uncompensated personnel of the Selective Service System who have served for more than two years, including local board examining physicians and dentists and members of medical advisory boards. The medal will be known as the Selective Service Medal.

The Senate Committee on Military Affairs concluded hearings, May 1, on the Ellender bill, S. 637, providing for the deferment of premedical and predental students. Dr. Victor Johnson, Secretary of the Council on Medical Education and Hospitals, and Dr. Harvey B. Stone, a member of that Council, appeared on behalf of the Association in support of the bill. No further action has been taken by the committee.

Medical and Dental Corps

S. 939 and H. R. 3070 have passed respectively the Senate and the House, authorizing the Secretary of War, for the duration of the wars in which the United States is currently engaged and for six months thereafter, to dispense with any part of the examination for promotion in the Regular Army of officers of the Medical, Dental and Veterinary Corps, except those relating to physical examination.

The bill removing the limitation on the right to command of officers of the Dental Corps of the Army which limits such officers to command in that corps, S. 916, has been reported to the Senate by the Committee on Military Affairs with the recommendation that it pass.

Representative Adams, New Hampshire, has introduced, by request, a bill, H. R. 3147, authorizing the appointment of medical technologists as commissioned officers in the Army of the United States and in the Naval Reserve for service with the Medical Department of the Army and of the Navy.

Physically Handicapped Persons

A subcommittee of the House Committee on the Judiciary has ordered favorably reported to the full committee H. J. Res. 23, naming the first week in October as "National Employ the Physically Handicapped Week."

Two recent bills relate to the employment of blind persons. One, S. 987, introduced by Senator Myers, Pennsylvania, proposes to amend the civil service laws of the United States to provide that no person shall be discriminated against in any case because of his or her total or partial blindness in examination, appointment, reappointment, reinstatement, reemployment, promotion, transfer, retransfer, demotion, removal or retirement, unless normal eyesight is absolutely indispensable in the doing of the physical acts to be performed. This bill is pending in the Senate Committee on Civil Service. The other bill, H. R. 3192, introduced by Representative Patrick, Alabama, would encourage and promote the employment of blind persons in public service and in private enterprise by establishing in the United States Employment Service a Division of Blind Placement Agents to stimulate the employment of blind persons.

Veterans Administration

A bill introduced by Senator Downey, California, S. 947, proposes the hospitalization and treatment in Army, Navy and Veterans Administration hospitals of accredited war correspondents who suffer disability as a result of personal injury sustained or illness or disease contracted in the performance of duties outside the continental limits of the United States in time of war.

Two bills, S. 973, introduced by Senator Johnson, Colorado, and H. R. 3115, introduced by Representative Rankin, Mississippi, would liberalize and clarify the laws administered by the Veterans Administration relating to entitlement to domiciliary or hospital care, medical treatment and related services.

Another bill, introduced by Representative Ellsworth, Oregon, H. R. 3166, proposes aid in providing housing for veterans attending educational institutions under the G. I. Bill of Rights.

Representative Bolton, Ohio, has introduced H. R. 3164, to establish the office of adviser to the Administrator of Veterans' Affairs on matters relating to Negro veterans.

S. 974, introduced by Senator Johnson, Colorado, proposes to liberalize and clarify rehabilitation and education and training laws administered by the Veterans Administration. Among other things, this bill would make available under the G. I. Bill of Rights education and training irrespective of whether the education of the veteran was interfered with by entry into service, would make available courses of instruction by correspondence and would increase the amounts payable to veterans undergoing training in pursuance of the rehabilitation program.

Miscellaneous

H. R. 2992 has passed the House extending for a period of one year Public Law 163, 77th Congress, authorizing the Secretary of War and the Secretary of the Navy to establish quarantine boundaries around camps and cantonments and naval bases for the purpose of cooperating with state and local authorities in prohibiting illicit practices calculated to spread venereal diseases. A companion bill, S. 948, is pending in the Senate with a favorable committee report.

A bill introduced by Representative Barry, New York, H. R. 3105, would amend the Federal Trade Commission Act to require publication of facts regarding violations in cases of false advertising of food, drugs, devices and cosmetics. The duty to effect publication will be devolved on the person, partnership or corporation complained of.

Companion bills, S. 962, introduced by Senator Russell, Georgia, for himself and Senator Ellender, Louisiana, and H. R. 3143, introduced by Representative Flannagan, Virginia, propose assistance to the states in the establishment, maintenance, operation and expansion of school lunch programs.

District of Columbia

On April 25 the Senate passed a bill to establish a modern hospital center in the District of Columbia, S. 223. On the following day Senator Ellender entered a motion to reconsider the vote by which the bill was passed, and this motion was considered by the Senate on May 10. After considerable discussion the Senate rejected Senator Ellender's motion to reconsider, and the bill was transmitted to the House of Representatives for further consideration.

Health programs for government employees are proposed by H. R. 2716, which has been reported to the House by the Com-

mittee on Civil Service with a recommendation that it pass. Such health programs, it is contemplated, will be limited to (1) treatment of minor illnesses and dental conditions except in cases of emergency or injury or illness sustained while in the performance of the employee's duty, (2) preemployment and other examinations, (3) referral of employees to private physicians and dentists and (4) education and preventive programs relating to health, including the alleviation of health hazards in the working environment.

The salary of the Executive Secretary, Nurses' Examining Board, District of Columbia, would be increased by a bill that passed the House of Representatives recently, H. R. 2839.

STATE LEGISLATION

Alabama

Bills Introduced.—S. 38 proposes to regulate the manufacture, sale and commercial use of cosmetics and to eliminate from intrastate commerce cosmetics which may be dangerous, injurious or hazardous. S. 12 and H. 116, to amend the narcotic drug act, proposes so to define narcotic drugs as to include isonipecaine. S. 87 proposes to authorize the sexual sterilization of certain socially inadequate inmates of state institutions.

Florida

Bills Introduced.—S. 80 proposes to authorize the establishment of a College of Medicine at the University of Florida. S. 237, to amend the workmen's compensation act, proposes, in effect, to make compensable disability from occupational diseases arising out of and in the course of employment. S. 361, to amend the narcotic drug act, proposes so to define narcotic drugs as to include isonipecaine. H. 400 proposes to require chiropractic licentiates to register annually on or before January 1 with the state board of health and at that time to pay a fee of $1. H. 402 proposes to authorize the establishment of hospital service plan corporations to operate hospital service plans whereby hospital care may be provided at the expense of such corporations to subscribers to such plans by hospitals which have contracts for such care with the corporation.

Illinois

Bill Introduced.—S. 436 proposes to create a commission to investigate the need for developing facilities for the care and treatment of persons who are chronically ill.

Missouri

Bills Introduced.—H. 392 proposes to establish the Southeast Missouri State School for the feebleminded and epileptic. H. 418 proposes to regulate the sale and use of insecticidal or pest control powders containing sodium fluoride, sodium fluosilicate, arsenic or any other poisonous compound. Such substances may be sold only if (1) they are mixed with a coloring substance in sufficient quantity so that the coloring is discernible and (2) the container indicates the poisonous nature of the compound, states the percentage of active ingredient in the mixture and lists one accepted antidote.

Woman's Auxiliary

WINNERS IN THE HYGEIA CONTEST

The American Medical Association offered $400 in cash prizes to the state and county auxiliaries which obtained the largest number of subscription credits to *Hygeia* during the contest, which covered the period from Sept. 1, 1944 to Jan. 31, 1945.

Cash prizes were awarded as follows:

Group 1. Auxiliaries with a membership of 1 to 13:

First prize, $40, to Walla Walla Valley, Wash., Mrs. C. R. Garrett, Hygeia chairman, Walla Walla, Wash.

Second prize, $25, to Cass County, Mo., Mrs. David Long, Hygeia chairman, Harrisonville, Mo.

Third price, $15, to Perry County, Mo., Mrs. J. J. Bredall, Hygeia chairman, Perryville, Mo.

Group 2. Auxiliaries with a membership of 14 to 23:

First prize, $40, to St. Joseph County, Mich., Mrs. A. E. Brunson, Hygeia chairman, Colon, Mich.

Second prize, $25, to Snohomish County, Wash., Mrs. Bernard Berenson, Hygeia chairman, Everett, Wash.

Third prize, $15, to Calhoun County, Ala., Mrs. C. H. Cleveland, Hygeia chairman, Anniston, Ala.

Group 3. Auxiliaries with a membership of 24 to 42:

First prize, $40, to Kitsap County, Wash., Mrs. F. C. Taylor, Hygeia chairman, Bremerton, Wash.

Second prize, $25, to Utah County, Utah, Mrs. W. T. Hasler, Hygeia chairman, Provo, Utah.

Third prize, $15, to Kenosha County, Wis., Mrs. Stephen DeFazio, Hygeia chairman, Kenosha, Wis.

Group 4. Auxiliaries with a membership of 43 to 542:

First prize, $40, to Westmoreland County, Pa., Mrs. A. B. Blackburn, Hygeia chairman, Latrobe, Pa.

Second prize, $25, to Pierce County, Wash., Mrs. J. B. Robertson, Hygeia chairman, Tacoma, Wash.

Third prize, $15, to Buchanan County, Mo., Mrs. C. H. Werner, Hygeia chairman, St. Joseph, Mo.

State winners:

First prize, $40, to state of Washington, Mrs. H. W. Johnson, Hygeia chairman, Everett.

Second prize, $25, to state of Utah, Mrs. Elden Clark, Hygeia chairman, Provo.

Third prize, $15, to state of Missouri, Mrs. D. I. L. Seabaugh, Hygeia chairman, Jackson.

Honorable Mention was given to the following counties:

Prince Georges County, Md., Mrs. Aaron Deitz, chairman, Hyattsville.

Wayne County, Mich., Mrs. W. G. Mackersie, chairman, Detroit.

Jackson County, Mo., Mrs. W. B. Allen, chairman, Kansas City.

Mercer County, Pa., Mrs. John Wassil, chairman, Sharon.

Carbon County, Utah, Mrs. R. W. Robinson, chairman, Kenilworth.

King County, Wash., Mrs. T. T. Robson, chairman, Seattle.

Rock County, Wis., Mrs. H. E. Kasten, chairman, Beloit.

Laramie County, Wyo., Mrs. K. L. McShane, chairman, Cheyenne.

Other counties that have reached or exceeded their quota and had at least 25 subscription credits were Madison County, Ala.; Palm Beach County, Fla.; Richmond County, Ga.; Cook County, Ill.; Rock Island County, Ill.; St. Clair County, Ill.; Sangamon County, Ill.; Vermilion County, Ill.; Cass County, Ind.; Sullivan County, Ind.; Vigo County, Ind.; Dallas-Guthrie counties, Iowa; Dubuque County, Iowa; Central District, Kan.; Saline County, Kan.; Ouachita Parish, La.; Cape Girardeau County, Mo.; Greene County, Mo.; Lafayette County, Mo.; Pettis County, Mo.; Atlantic County, N. J.; Gloucester County, N. J.; Randolph County, N. C.; Stark County, Ohio; Beaver County, Pa.; Blair County, Pa.; Bucks County, Pa.; Lebanon County, Pa.; Mifflin County, Pa.; Venango County, Pa.; Warren County, Pa.; Childress-Collingsworth-Hall counties, Texas; Hunt-Rockwell-Raines counties, Texas; Lamar County, Texas; Liberty-Chambers counties, Texas; Salt Lake County, Utah; Weber County, Utah; Clark County, Wash.; Cowlitz County, Wash.; Spokane County, Wash.; Whatcom County, Wash.; Brown-Kewaunee-Door counties, Wis.; Racine County, Wis.; Washington-Ozaukee counties, Wis.

Other states that reached or exceeded their quotas were Illinois and Wyoming.

This year's contest resulted in 10,894 subscription years as compared to 8,322 subscription years received during last year's contest.

To the state and county Hygeia chairmen, officers and members of the various county and state woman's auxiliaries who have assisted in making this contest a success, Mrs. Arthur I. Edison, national Hygeia chairman, and the circulation manager of *Hygeia* express appreciation.

Bureau of Information

INFORMATION FROM FOURTEEN REPRESENTATIVE COUNTIES IN ILLINOIS

The first summary sheets from counties containing very large cities have been received from the Illinois State Medical Society through its executive secretary, Dr. Harold M. Camp.

The accompanying table gives some of the economic features of fourteen representative counties in Illinois, including rural areas and the large urban area of Chicago.

Economic Features of Fourteen Counties in Illinois

County[1]	Principal Cities[2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone[3]
Bond		13,025	4	3,256	8.6
	Greenville	3,391			
Cook		3,968,320	3,245	1,223	5.8
	Chicago	3,396,808			
	Oak Park	66,015			
	Evanston	65,389			
Cumberland		9,466	2	4,733	11.9
Fayette		23,351	7	3,336	10.4
	Vandalia	5,288			
Grundy		18,282	9	2,031	8.6
	Morris	6,145			
Jasper		10,872	1	10,872	13.7
	Newton	2,347			
Jersey		12,667	4	3,167	12.7
	Jerseyville	4,809			
Jo Daviess		19,629	9	2,181	7.2
	Galena	4,126			
Lee		32,237	11	2,931	6.7
	Dixon	10,671			
Macon		84,638	54	1,567	8.3
	Decatur	59,305			
Pike		20,927	4	5,232	8.5
	Pittsfield	2,884			
Pope		5,668	2	2,834	9.6
Sangamon		113,393	63	1,800	7.5
	Springfield	75,503			
Winnebago		126,110	88	1,433	9.2
	Rockford	84,637			

1. Bureau of census, estimated population 1943.
2. Bureau of census, population 1940.
3. Based on 1940 figures, American Telephone and Telegraph Company.

Excerpts from the remarks contained on some of the county summary sheets follow:

Lee.—Two or three towns in this county of 600 to 800 population, 12 to 15 miles from a hospital, have one or no doctors.

Macon.—Men now in service plan to return here after the war. In addition there are fifteen to twenty younger men who have never practiced that plan to come back to this, their home town, to practice.

Pike.—Better than average facilities for practice in a county of this size.

Sangamon.—All doctors now in service from this county plan to return. The present prosperity is largely due to war work. After the war this will be a poor location for new doctors, as about fifteen local boys who have not practiced expect to locate here.

Winnebago.—If a maximum of 50 per cent of the doctors who practiced in this community and who are now in the armed forces return to practice here after the war, the medical facilities will be adequate.

Included with the Illinois summary sheets was a list of towns in the state that are now in need of physicians. Many of these communities have good opportunities for physicians desirous of a locality in which to establish a practice. Inquiries from veteran medical officers about these and other areas will be answered so that interested officers will be given helpful information and be referred to the local medical societies concerned for further investigation. Since vacancies are being held open in many communities for doctors now in military service, direct correspondence with the county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

Official Notes

REGISTRATION UNDER THE HARRISON NARCOTIC ACT

A Reminder from the Bureau of Legal Medicine

Physicians, other than those in the armed services, who are registered under the Harrison Narcotic Act or under the Marihuana Tax Act must effect registration on or before July 1 to avoid a penalty. Each year, despite the annual warnings in THE JOURNAL, this requirement is overlooked by some physicians and unpleasant consequences follow. Failure to register adds a penalty of 25 per cent to the tax payable and in addition subjects the physician to the possibility of a fine not exceeding $2,000 or to imprisonment for not exceeding five years, or to both. As an act of grace the Commissioner of Internal Revenue has in past years given some tardy registrants the choice between paying sums by way of compromise, a procedure authorized by law, or of accepting criminal prosecution. If this procedure does not produce the required promptness in reregistration, the commissioner will have no other alternative than to institute criminal prosecution.

A physician in the armed forces need not reregister. If he receives an application form for reregistration, it should be returned to the office of the Collector of Internal Revenue together with a statement showing that he is in service and requesting that the registration number previously assigned to him be reserved. A physician on entering service should return all unused order forms to the collector's office and should dispose of all narcotics or cannabis on hand either by returning them to the wholesale concern from which purchased, if the packages are in unbroken form, or by transferring the narcotics or cannabis to another physician after having obtained permission for such transfer from the office of the Collector of Internal Revenue.

A physician entering service also is required to return the special tax stamp to the collector, who will mark the stamp "Business Discontinued" with the date and return the stamp to the physician to be retained in his files for a period of not less than two years. When a physician is discharged from military service and reengages in civilian practice during the same fiscal year for which his registration has been canceled he will not be required to secure another stamp and pay a second tax for the remainder of that fiscal year. Such a physician should notify the office of the Collector of Internal Revenue, within thirty days of resuming practice, of his intentions to reenter the private practice of medicine. He should return the special stamp retained in his files to the collector so that the notation "Business Discontinued" may be crossed out and a proper notation made on it, indicating that private practice has been resumed.

DOCTORS LOOK AHEAD

First topics for the next several weeks of the radio series Doctors Look Ahead are as follows:

May 19. Look Sharp.

May 26. Unfinished Business; speaker, Morris Fishbein, Editor, THE JOURNAL.

June 2. Fit to Live: an appraisal of the nation's health and of its fitness for war and for the peace to come.

June 9. They Shall Hear Again: a program devoted to the interests of all those with hearing defects; speaker, Howard A. Carter, Secretary of the American Medical Association Council on Physical Medicine.

June 16. American Spas; speaker, Walter S. McClellan, New York.

Some stations may record the program and broadcast it at a time which suits their schedule better. Local newspaper radio announcements should be consulted.

It is sometimes necessary to cancel or postpone certain programs because of unforeseen developments due to world events.

When no speaker is announced the summary will be given by Dr. W. W. Bauer, Director of the Bureau of Health Education. Doctors Look Ahead is heard on one hundred and twenty-three stations of the National Broadcasting company network each Saturday at 4 p. m. Eastern War Time (3 p. m. Central War Time, 2 p. m. Mountain War Time and 1 p. m. Pacific War Time).

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

COLORADO

Refresher Course in Rheumatic Fever.—The University of Colorado School of Medicine, Denver, will conduct a three day refresher course on rheumatic fever June 4-6. The subject will be presented from the standpoint of incidence, epidemiology, diagnosis, treatment and prophylaxis. Presentation of the subject material, much of which will be made available through the Denver Area Rheumatic Fever Diagnostic Service, will involve demonstration clinics and well illustrated lectures. Through the courtesy of the Public Service Company of Colorado an electric stethoscope with loud speaking amplification will be available for the clinical demonstration of heart sounds.

CONNECTICUT

Society News.—Dr. Vladimir Lebedenko, representative in the United States of the Mission of Alliance of Red Cross and Red Crescent Societies of the Soviet Union in the United States, addressed the Yale Medical Society, New Haven, April 11, on "Organization of Russian Medicine in Wartime."

Personal.—Charles-Edward Amory Winslow, Dr.P.H., New Haven, will make a survey of health and hospital facilities in the Washington metropolitan area for the Metropolitan Health Council of Washington, according to *Science.*——Dr. Stanley H. Osborn, Hartford, state health officer, recently was awarded the honorary degree of doctor of public health by Trinity College, Hartford.

DISTRICT OF COLUMBIA

Personal.—Lieut. Col. Leo V. Schneider, M. C., associate clinical professor of medicine, Georgetown University School of Medicine, and chief medical officer of Glenn Dale Sanatorium, Glenn Dale, Md., has been made chief of industrial medicine, New York Port of Embarkation.

Borderline Certificates Continued.—In accordance with action at a recent meeting of the representatives of the Commission on Licensure of the District of Columbia and the Board of Medical Examiners of Maryland, the latter rescinded its action concerning the approval of borderline certificates and voted to continue issuing the certificates for the duration of the war (THE JOURNAL, Dec. 16, 1944, p. 1039).

Captain Newhouser Gives Kober Lecture.—The 1945 Kober Foundation lecture was delivered by Capt. Lloyd R. Newhouser (MC) on "The Role of Whole Blood Plasma and Plasma Fractions in War Medicine." The lecture was given March 28, the birth date of the late Dr. George M. Kober, for many years dean of the Georgetown University School of Medicine and founder of the lecture. Captain Newhouser was presented with an honorarium of $500 by Lawrence C. Gorman, S.J., president of Georgetown University, who stated that the selection had been made this year by the Association of Military Surgeons of the United States. Vice Admiral Ross T. McIntire, Surgeon General of the Navy, presided.

John Owen Named to New Bureau.—Dr. John F. Owen, superintendent of the State Hospital, Raleigh, N. C., has been appointed in charge of the new mental hygiene bureau in the health department of the District of Columbia. Under the supervision of Dr. George C. Ruhland, health officer, he will develop a program of mental hygiene in the District to include the establishment of clinics for school and preschool children, children involved with the Juvenile Court and Detention Home, alcoholic and drug addicts, adults accused of antisocial behavior and patients now in St. Elizabeths Hospital who need only psychiatric supervision. The *Medical Annals of the District of Columbia* states that the project will be financed by an appropriation of $24,340.

GEORGIA

University to Construct Hospital for Indigent.—The Georgia Legislature recently enacted a bill authorizing the board of regents of the University System of Georgia to construct and operate a hospital for the indigent sick and near indigent sick in conjunction with the University of Georgia School of Medicine, Augusta.

Coordinator of Health Education.—Mr. J. M. Gooden, formerly state school supervisor, has been chosen state coordinator of health education to inaugurate a program to coordinate and utilize all available services of the state which can contribute to the promotion of better health among Georgians. Mr. Gooden was chosen by a joint committee from the Georgia Department of Public Health, the state department of education and the University System of Georgia. The program will be confined principally in the beginning to a few selected countries where an intensive health program will be developed in the schools and communities, according to *Georgia's Health.* A grant from the W. K. Kellogg Foundation, Battle Creek, Mich., is financing the project. Mr. Gooden's headquarters are with the Georgia Department of Public Health, Atlanta 3.

IOWA

State Medical Election.—Dr. Robert L. Parker, Des Moines, was chosen president-elect of the Iowa State Medical Society at its meeting in April. Dr. Ransom D. Bernard, Clarion, was installed as president. Dr. John C. Parsons, Des Moines, is secretary and Miss Mary L. McCord, Des Moines, executive secretary. The 1946 meeting will be held in Des Moines, the tentative dates having been set as April 17-19.

Tropical Diseases.—The State University of Iowa College of Medicine, Iowa City, and the state department of health, in cooperation with the U. S. Public Health Service, will conduct a special laboratory course in malaria and other tropical diseases at the state hygienic laboratory, Iowa City, July 23-28. The instructors will be Dr. Milford E. Barnes, professor of hygiene and preventive medicine, and Kenneth MacDonald, Ph.D., assistant professor, both of the college of medicine, and Dr. Irving H. Borts, director of the state hygienic laboratory.

KANSAS

University News.—Mrs. Logan Clendening, Kansas City, Mo., has been appointed by the chancellor of the University of Kansas to be the curator of the library of medical history, which was endowed in the will of the late Dr. Clendening (THE JOURNAL, April 7, p. 934).——The plan to establish a memorial fund in honor of the late Dr. Clarence B. Francisco, Kansas City, Mo. (THE JOURNAL, April 15, 1944, p. 1142), has considerably enlarged into a campaign for a student union building including a dormitory, gymnasium and cafeteria, a special lounging room in the building and library to be set aside as a memorial to Dr. Francisco. According to the *Journal of the Kansas Medical Society* $43,000 of the proposed cost of $300,000 has been subscribed.——Paul G. Roofe, Ph.D., assistant professor of anatomy, University of Louisville School of Medicine, has been appointed professor of anatomy and chairman of the department of anatomy, University of Kansas School of Medicine, effective September 1. ——The recent legislature provided for $350,000 for a new surgical building at the medical school, referred to as a connecting corridor, which will add 70 to 90 beds to the hospital.

NEBRASKA

Personal.—Dr. Chauncey M. Pierce was recently elected president of the Chadron chamber of commerce.——Dr. Leland C. Albertson has resigned as medical director of the Hospital for the Tuberculous, Kearney, effective May 1. Dr. Albertson has been associated with the hospital since 1934 and has served as director since 1940.

Prepayment Sickness Insurance.—The Nebraska State Medical Association has approved the Nebraska Surgical Plan for nonprofit prepayment sickness insurance benefits. The plan, which has been in operation in Douglas County since Nov. 1, 1944, will be integrated with the Blue Cross, which for a small fee pays subscribers' hospital bills within certain limitations. The surgical plan offers subscribers, for a monthly fee, surgical, maternity, x-ray, pathologic and anesthesia benefits. It also provides for treatment of certain minor surgical cases in the physician's office, such as fracture of the wrist, minor lacerations or incision of a boil. It does not cover medical service, such as house visits in the case of ordinary illness for conditions such as infectious diseases, influenza, pneumonia or other medical afflictions. When sufficient experience has been accumulated, benefits for treatment of medical cases confined within a hospital will be added to the surgical-maternity benefits. The benefits now offered would be available to all immediate members of a family for only $2 a month. Without maternity benefits an individual's assessment would be 75 cents a month, and an individual with one dependent

would pay $1.50 a month. To insure a fair cross section of subscribers, the surgical plan, like Blue Cross, is offered only on a group basis. In rural areas it is proposed to enroll farm groups through project clubs, townships, school districts and such cooperative groups as the Farmers Union. The members of the planning committee of the state association which proposed the plan to the association after a year's study are Drs. Floyd L. Rogers, Lincoln, chairman; Albert L. Cooper, Scottsbluff; Morris Nielsen, Blair; Donald B. Steenburg, Aurora, and Arthur J. Offerman, Omaha. The business administration of both the Nebraska Surgical Plan and the Blue Cross will be in charge of J. H. Pfeiffer, Omaha, executive director. Each plan, however, will have its own board of directors.

NEW HAMPSHIRE

New Roentgen Ray Society. — The New Hampshire Roentgen Ray Society was recently organized with Dr. Fred S. Eveleth, Concord, president, and Dr. Richard C. Batt, Berlin, secretary-treasurer. The aim of the society is to maintain and improve radiologic service in the state and to promote cooperation between clinicians, radiologists and hospitals.

NEW YORK

Need of Diagnostic Clinics Studied. — The Medical Society of the State of New York is conducting a survey to determine the need for diagnostic aid centers. The study is being directed by the society's subcommittee on laboratory service and medical care.

New York City

University News.—Dr. John J. H. Keating, 1917 graduate, was chosen president of the Association of the Alumni of the Columbia University College of Physicians and Surgeons at its annual dinner April 21. Other officers include Drs. Bernard S. Oppenheimer, class of 1901, vice president; James A. Corscaden, class of 1906, treasurer; Charles C. Lieb, class of 1906, secretary, and T. Lloyd Tyson, class of 1931, historian.

New Orthopedic Fellowship.—The Mr. and Mrs. Frederick Brown Orthopedic Research Fellowship has been created at the Hospital for Joint Diseases by Mr. Frederick Brown, president of the hospital, with an initial gift of $7,500 on the occasion of his seventy-fifth birthday. Immediately after the war and as soon as young physicians return from military service, the hospital will begin awarding the research fellowship to carefully selected candidates to be nominated by a committee on awards consisting of Mr. Brown, Mr. Max Wilner, chairman of the board; Mr. L. F. Rothschild, treasurer; Dr. Abraham J. Beller, president of the medical advisory board; Dr. Henry L. Jaffe, director of laboratories, and Dr. Jacob J. Golub, medical director of the hospital. Under the terms of the fellowship the recipients of the awards will be chosen without regard to race, creed or color. Applicants must be graduates of approved medical schools and must have completed previous internships and approved residencies. The selection will be made on a merit basis, the qualifications being essentially scholarship, previous training and research tendencies.

Nutrition Clinic Established.—A city-wide nutrition clinic has been established at the lower East Side Health and Teaching Center with Dr. Norman H. Jolliffe as chief of clinic, according to Dr. Frank A. Calderone, acting city commissioner of health. Objectives of the clinic are:

To furnish a diagnostic and treatment center and consultation clinic for patients suspected of having nutritional abnormalities.

To furnish a training center for physicians, nurses and others interested in the diagnosis, treatment and prevention of deficiency diseases.

To develop and correlate diagnostic methods for the detection of early nutritional diseases.

To determine the significance of various manifestations of nutritional diseases.

To determine the most effective methods of treatment and prevention of deficiency diseases.

To obtain information concerning food habits in relation to nutritional disease.

To translate, when indicated, the diagnostic procedures and conclusions of this clinic into practice in other health department units.

Plans are being formulated for the Public Health Research Institute and the nutrition division of the department of health to cooperate with the nutrition clinic so that it will be possible to correlate the dietary and chemical studies with the medical findings.

Gifts to Long Island College of Medicine.—Gifts and grants totaling $127,374.15 were made to the Long Island College of Medicine, Brooklyn, in the year ended January 1 for nine research projects, new college laboratory facilities, scholarships, student aid and a library for the new William Alanson White Clinic. Contributions through the development fund still in progress comprised the largest single item on the report, with a total in gifts secured up to January 1 of $63,784.05. This fund was used to provide new laboratories for the departments of medicine, anatomy, biochemistry and radiology, for which extensive structural alterations have been made in the Polhemus Memorial Building at 350 Henry Street, the Hoagland Laboratory Building at 335 Henry Street and the Polak Laboratory at 123 Pacific Street. The second largest item was a continuation of the six year grant from the Commonwealth Fund, which gave $16,890.83 for the development of the college's new department of psychiatry, which is located in a new building at 88 Amity Street and named after the late Dr. William Alanson White, graduate of the college in the class of 1891, who was director of St. Elizabeths Hospital, Washington, D. C. The initial grant of $5,112.50 for this department was made in 1943. An anonymous contribution of $2,500 was made for the library of this new psychiatric clinic. Another anonymous contribution of $4,900 was made to install new laboratory and library facilities in the college division at Kings County Hospital. When completed this whole project will cost $10,000, with the remainder to come out of development fund contributions. A new endowed scholarship amounting to $5,350 was established in the name of Mrs. Sarah Beinfield Messing, whose son is a graduate of the college and whose grandson is a member of the present senior class. A new prize award was established in 1944 by the late Mrs. Joseph Howard Raymond with a gift of $995 in memory of the late Dr. Joseph Howard Raymond, secretary of the faculty from 1888 to 1915 and professor of physiology from 1873 to 1915.

OHIO

University News.—The Commonwealth Fund has appropriated $8,200 to be used by Dr. Carl J. Wiggers and associates of the department of physiology, Western Reserve University School of Medicine, Cleveland, to continue their studies on the peripheral circulation and shock during 1945-1946.

Graduate Assembly.—The seventeenth annual postgraduate assembly of the Mahoning County Medical Society was conducted at the Pick-Ohio Hotel, Youngstown, April 11, among others, by members of the faculty of Marquette University School of Medicine, Milwaukee. The speakers included:

Dr. Frederick W. Madison, Present Trends in Hemorrhagic Diseases.
Dr. Carl W. Eberbach, Treatment of Biliary Tract Diseases.
Dr. Francis D. Murphy, Diagnosis and Treatment of Nephritis.
Dr. Eben James Carey. The Future of Medicine.

Narcotic Ring Exposed.—On March 30 a $100,000 a year "dope racket" in the Akron area was exposed by federal narcotic agents, according to the Akron *Beacon Journal*. The so-called ring is said to involve 150 addicts. The seven persons arrested included two physicians, Drs. Erich Otten and Roy T. Haskell, both of whom were charged with the "sale of narcotics," pleaded not guilty and were freed under $1,500 bond. Dr. Haskell is reported to have written drug prescriptions in the name of a patient, now dead, and continued to obtain drugs in that patient's name.

Personal.—Dr. Howard Dittrick was reelected president of the Cleveland Medical Library Association at its recent meeting. Dr. Dittrick is also director of the association's museum. Dr. Justin A. Garvin was elected secretary.——Drs. Robert H. Bishop Jr., director of the University Hospitals, and Henry J. Gerstenberger, director of pediatrics, Babies and Childrens Hospital, Cleveland, were given diplomas recently from the Hospital Infantil, Mexico City, in recognition of their work in training physicians and nurses from Mexico City.——Dr. Arthur D. Blackburn, Circleville, health commissioner of Pickaway County, has been elected vice president of the United Roller Club of America, an organization which promotes interest in roller pigeons.——Dr. William Edward Blair, Lebanon, who has completed twenty-five years as health commissioner of Warren County, has been reappointed for an additional two year term.——Dr. Edwin J. Cauffield, Akron, completed fifty years in the practice of medicine, March 25.

TENNESSEE

Enjoined from "Practicing" in Florida—Runs Clinic in Tennessee. — William Estep, who was enjoined from the practice of medicine in what was known in Pensacola, Fla., as a Vita-Ray Clinic, has opened the "Memphis Research Clinic" and was on April 12 advertising the institution as an "x-ray clinic for chronic diseases," according to the Memphis *Commercial Appeal*. It was stated that the injunction restraining Estep from practicing medicine in Florida was decreed last December 4 by Judge Ernest E. Mason of the Escambia County, Fla., Court of Record. The case is now pending before the Florida Supreme Court on appeal, it was stated.

Estep is said to have recorded a license as a naturopathic physician. Dr. Harley W. Qualls, secretary of the Tennessee State Board of Medical Examiners, is reported to have said that there is no doctor with the name William Estep in any state in the United States licensed to practice medicine. On warning by the secretary of the state board that as a naturopathic physician he was not entitled to use x-rays, Estep is supposed to have said that his attorney had told him it was permissible. Dr. Qualls, in a statement to the press, said that he visited the clinic and was surprised to learn, following his examination by Estep, that he had high blood pressure, sinus trouble caused by "pus pockets," and six stomach ulcers. In addition to what Estep said were "vita-ray" and "electromagnetic" treatments for the sinus and ulcers, Dr. Qualls was given prescriptions for drugs to take for each ailment. The Florida State Board of Medical Examiners revoked Estep's license, Nov. 23, 1942 on the grounds that it had been obtained fraudulently from the late Dr. George A. Munch, secretary of the old Eclectic Board, who served a sentence in federal prison for using the mail to defraud.

VERMONT

University News.—Dr. Harold E. Himwich, professor of physiology and pharmacology at Albany Medical College, recently addressed the Osler Clinical Society, the student's organization at the University of Vermont College of Medicine, Burlington, on "Hypoglycemia, Its Physiology, Pathology, Symptoms and Treatment." Capt. Arthur E. MacNeill, M. C., also spoke before the society recently on "The Work of an Army Air Force Flight Surgeon." Dr. John F. McIntosh, secretary to the McGill University Faculty of Medicine, Montreal, Quebec, addressed the society April 4 on the problem of urinary calculi in ancient times and in a modern clinic.

WASHINGTON

Dean Now Sought for New Medical School.—One of the first steps toward the creation of the University of Washington Medical-Dental School will be the selection of a dean who will be the adviser and director of future developments. The school will be confined to teaching the basic sciences of anatomy, physiology, chemistry, pathology and bacteriology, subjects already established in the premedical courses (THE JOURNAL, April 21, p. 1067).

WEST VIRGINIA

Hospital News.—The state legislature has passed a bill designating the state health department as the sole state agency to deal with the federal government concerning a bill pending in Congress appropriating one million dollars for postwar hospital construction and five million dollars to finance state surveys of hospital needs. The bill in the state legislature authorizes the governor to appoint an advisory committee to consult with the state health department in all matters concerned with the new project. The Barboursville unit of the Weston State Hospital (mental), Weston, will hereafter be known as the Barboursville unit of the Huntington State Hospital, Huntington, in accordance with a recently passed bill.

GENERAL

Actions on 1945 Conventions.—Reports received by the American Medical Association indicate the following action for the 1945 sessions of the respective organizations:

American Ophthalmological Society, canceled.
Maine Medical Association, canceled.
Utah State Medical Association, canceled.

Dr. McQuarrie Named Editor of Brennemann's Practice of Pediatrics.—Dr. Irvine McQuarrie, professor and head of the department of pediatrics, University of Minnesota Medical School, Minneapolis, has been appointed editor of Brennemann's Practice of Pediatrics, published by W. F. Prior Company, medical publishers, Hagerstown, Md.

Facts About Tuberculosis.—The United States Public Health Service has made available a second presentation in graphic form of the statistics regarding tuberculosis in the United States. It is devoted to proportionate mortality statistics for the states in geographic divisions. Deaths are classified according to age, sex and race and are comparative for the last three decades.

Research Council to Act as Adviser to Cancer Society.—The National Research Council has agreed to act as adviser to the American Cancer Society in its proposed comprehensive research program on the entire cancer problem. About one third of the five million dollars now being sought in the society's campaign for funds is to be devoted to cancer research. The role of adviser will be carried out through the division on medical sciences of the National Research Council, which will establish a committee on growth of fifteen members.

Medical Advisory Committee Named for Compensation Commission.—A medical advisory committee has been appointed to the United States Employees' Compensation Commission to advise on special medical problems incident to the handling of cases of silicosis reported under the federal workmen's compensation laws. Members of the committee include Dr. Royd R. Sayers, director of the Bureau of Mines, U. S. Department of the Interior, Washington, D. C.; Dr. Leroy U. Gardner, Saranac Lake, N. Y.; Lieut. Col. Anthony J. Lanza, M. C., and Dr. Clarence D. Selby, Detroit. The first meeting was held May 10 in New York.

Biometrics.—The American Statistical Association has recently brought out a *Biometrics Bulletin*, official organ of the biometrics section of the association. It is designed primarily for biologists who see in statistics a potent tool for their work and will be developed to meet the needs of the membership. The biometrics section of the American Statistical Association was established in 1938. The first issue includes a discussion of the new bulletin, an article on "Some Uses of Statistical Methods in Medicine" by John R. Miner, Sc.D., Rochester, Minn., abstracts, queries and news items. The new bulletin will be published six times a year by the association, 1603 K Street N.W., Washington 6, D. C. Material for the bulletin should be sent to Gertrude M. Cox, M.S., chairman of the editorial committee, North Carolina State College, Raleigh, N. C.

Improvement in Cancer Control.—Noticeable progress has been made in combating cancer, particularly among women, according to the statisticians of the Metropolitan Life Insurance Company. Among the insured white females aged 1 to 74 years the standardized cancer death rate dropped as much as 11 per cent in the decade 1934 to 1944, and even for the preceding quarter of a century the death rate from this cause stayed fairly stable or showed a downward trend for women in every age group below 65 years. "The net result of these developments," the statisticians say, "has been to bring the current death rates from cancer among the white women in the broad age of 25 to 64 years to the lowest levels on record in this third of a century of insurance experience; it is a striking fact that in the ages 35 to 54 the mortality dropped one fifth between 1911-1913 and 1942-1944. Even among white male policyholders the situation has shown slight improvement in recent years. The distinctly upward trend in the mortality from cancer which was manifest during the first quarter century of this insurance experience has been stemmed, if not reversed. During the past decade, at no age period beyond 25 years has the cancer death rate among these insured men increased; in fact, it appears that at some age periods the mortality has tended downward recently." The gain in the control of cancer mortality is attributed by the statisticians to a number of factors. Among these are the organized movement for such control, which has caused people to seek diagnosis and treatment earlier in the course of the disease, prevention of the disease itself by more attention to personal hygiene, and in women through better obstetric and postpartum care. Added to these factors aiding in the control of cancer are the constantly increasing number of physicians trained to deal effectively with the disease, the increase in the public and private facilities for the treatment of cases and the development of new and improved technics. Significant this year, the statisticians point out, is the fact that 1945 not only marks the one hundredth anniversary of the birth of Wilhelm Konrad Roentgen, born March 27, 1845, but also the fiftieth anniversary of his discovery of the x-rays, "which have proved invaluable in the diagnosis and treatment of cancer as well as of many other diseases."

PUERTO RICO

Legislation Affecting Pharmacy.—Under a bill passed by the legislature of Puerto Rico and waiting the governor's signature, the Board of Pharmacy of Puerto Rico would have the power to regulate the practice of pharmacy. Under the bill the "assistant pharmacists," or "practical pharmacists" as they are called in Puerto Rico, would have legal recognition but would be subject to legal regulation, and they would be required to perform their work under the supervision of registered pharmacists all the time.

Proposed Health Grants.—According to Dr. Antonio Fernos Isern, San Juan, commissioner of health of Puerto Rico, an appropriation of about $2,000,000 from federal funds will be given Puerto Rico for different health projects during

the fiscal year 1945-1946. The money would come from part of the $100,000,000 appropriation bill now pending in Congress for health and sanitation work in the states and territories, according to an announcement. Priorities have been obtained for the construction of twenty-five additional health units in Puerto Rico, for which the legislature appropriated funds recently. Dr. Fernos Isern stated that the federal money would be used for the construction of hospitals and public health centers to fight malaria, tuberculosis and venereal diseases in the island.

FOREIGN

The Harveian Lecture.—Sir Alexander Hood, director-general of the Army Medical Services, will deliver the Harveian lecture at the Royal College of Surgeons, England, May 28. His subject will be "Total Medicine."

Treatment Centers for Rheumatism.—The British Empire Rheumatism Council plans to cooperate in the establishment in Britain of a national chain of treatment centers to enable comprehensive tests under full control conditions to be made for evaluating present and proposed new means of treatment of rheumatism.

Appointment to New Chair of Industrial Health.—Dr. Ronald E. Lane, who has been lecturer in factory hygiene and lecturer in medicine at the University of Manchester, has been appointed to a new chair of industrial health, which was created recently by the Nuffield Foundation under a grant of £70,000. According to *Science* Dr. Lane is expected to take up his new work next September.

Personal.—Dr. James Mackintosh, dean of the London School of Hygiene and Tropical Medicine, has been lecturing in Sweden for the British Council on "Housing and Medicine" and "Nutrition and Medicine."——Dr. H. A. Krebs, who graduated in medicine at the University of Hamburg in 1925, has been appointed to the newly established chair of biochemistry in the University of Sheffield, Yorkshire, England, where some years ago he, as lecturer, founded a school of biochemical research which has received support from the Medical Research Council and the Rockefeller Foundation.

First Health Inspector General Named for South Pacific.—Dr. John C. R. Buchanan, formerly deputy director for medical services in Uganda, has been named the first health inspector general of the South Pacific in line with a new plan to create a Pacific public health service planned by the British Empire. According to the New York *Times* the decision to adopt the plan, which envisages joint public health and medical services for Fiji, the British western Pacific territories and New Zealand Island territories in Oceania was made in conjunction with London and Wellington. It followed an investigation of existing services in Fiji by New Zealand officials. The headquarters of the setup will be located in Suva Fiji, which is conveniently situated for training the necessary personnel and for expansion.

Growing of Herbs in Russia.—One hundred thousand acres on ten thousand collective farms in Russia are planted to medicinal herbs, and in the near future thirty new stations of the All-Union Medicinal Trust will begin gathering wild herbs and assisting in their cultivation on collective farms, as well as in their processing, the Russian Information Bureau reports, as published in the New York *Times*. Eight thousand tons of herbs was gathered in 1944 by the trust. Each summer groups of botanists explore all parts of the country to find new varieties. An expedition to the Tian-Shan mountains discovered vast growths of termopsis, the seeds of which are used in the production of medicines for treatment of ailments of the respiratory tract. From the Turkmenian desert came a plant from which salsolin, used for lowering blood pressure, is obtained, it was stated.

Joint OSE Medical Mission to Yugoslavia.—The Union of OSE, Geneva, cabled the OSE in New York City through the United States Legation in Bern on April 4:

> Joint OSE Medicosocial Relief Mission consisting of 6 physicians and 8 other staff members along with 7 tons of supplies, medical and restorative, left Switzerland March 17 for Yugoslavia via Marseilles. Its aim is emergency relief to displaced persons, particularly Jews liberated from camps and diffused throughout newly liberated territories. Received cabled news that our previous mission, consisting of 6 persons, left Naples for Hungary accompanied by American Jewish Joint Distribution Committee delegate Israel Jacobsohn. Joint OSE Polish Mission has now been provided with necessary supplies, is ready to start and is expecting visas shortly.

According to the information of the American Jewish Joint Distribution Committee its representative, Mr. Jacobsohn, went to Yugoslavia. Whether he will join the mission to Hungary and whether that mission will gain admission is still problematic.

Health Campaign in Sweden.—The Medical Association of Sweden and the Swedish Gymnastics League are sponsoring a general health campaign throughout the country. Physicians are giving lectures and demonstrations, and educational printed material is being distributed. Health weeks will be observed. On the initiative of the head of the new School Hygienics Bureau Dr. Carl W. Herlitz, Stockholm, Sweden, has adopted a uniform system of health registration in the schools. It is hoped to tie up this registration at school with the health registration of the Swedish conscripts. About $150,000,000 a year is expended in the treatment for diseases alone. In addition, losses in working hours and productive capacity cost about $250,000,000. This information is revealed in a recent survey by Dr. Sven Rydenfelt, Lund University, during the years 1940 and 1941. The bulk of these costs is paid by the state in the form of costs for public health and the care of the sick, benefit funds and invalidity relief. The remainder may be regarded as social-economic expenditure disbursed by the citizens, for example, for dental and medical treatment, medicine and payments to sick benefit funds, according to the Swedish International Press Bureau.

Air Ambulance Pilot Honored.—An air ambulance pilot of the Royal Swedish Air Force, Sergeant Major Allan Norberg, was recently awarded the prize for the most noteworthy Swedish flying feat of the year, instituted by the newspaper *Stockholms-Tidningen* and consisting of a gold medal and a grant of money. During a 950 kilometer flight to a remote place in the mountainous wilds of Lapland in order to save two Norwegian refugees, Sergeant Major Norberg was forced by bad weather to fly not more than 300 feet over the treetops. For seven years Norberg has been active as an air ambulance pilot, and during 1944 he transported in all 164 persons from isolated parts of Lapland to hospitals in the coastal towns, often under the severe weather conditions of arctic cold and heavy snowstorms. The Swedish air ambulance service was started in 1923 with support by the state and the Swedish Red Cross. It is now incorporated in the Swedish air force, which places aircraft and personnel at disposal. The ambulance planes are stationed at three airports in northern and central Sweden: at Boden, just below the arctic circle, at Östersund in the province of Jemtland, and at Hägernäs in the Stockholm archipelago. During the war years planes especially from the first mentioned station have been engaged in rescuing refugees who have crossed the border in northernmost Sweden.

CORRECTION

Minutes of Board of Trustees.—In the fourth line of the third paragraph, under "Appointments," in the abstract of minutes of the meeting of the Board of Trustees held Feb. 15 and 16, 1945 (THE JOURNAL, March 24, p. 719), "American Pediatric Society" should read "American Academy of Pediatrics."

Government Services

Industrial Hygiene Division Moves

On April 6 the outlying offices of the industrial hygiene division of the U. S. Public Health Service moved into building three of the National Institute of Health, Bethesda, Md. According to the Industrial Hygiene *News Letter* the move brings the entire division, with the exception of the chemical unit, in one building.

Consultant Services Extended by Industrial Hygiene Division

Dr. Walter E. Doyle, Surgeon (R), chief of the industrial hygiene division of the U. S. Public Health Service, recently completed the first of a series of tours planned in a program of extending the consultative services to the states. The first tour was carried on in U. S. Public Health Service District number 7, comprising the industrial hygiene units of Minnesota, Iowa, Missouri, Arkansas, Oklahoma and Kansas. According to *Industrial Medicine*, Dr. Doyle plans to visit every state and every local industrial hygiene unit in the state and in the nation. He is making the annual evaluation conducted by the industrial hygiene division in the units he visits, although major emphasis is placed on giving aid in the medical control of occupational disease.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 14, 1945.

Postgraduate Training of Medical Officers on Release from the Forces

The government recognizes that many medical officers who joined the armed forces during the war were unable to complete the postgraduate training usually received before entering into civilian practice and that others have had their normal professional experience interrupted or curtailed in certain respects over a period of years. The government thinks that every opportunity should be given to medical officers when released from the forces to continue their training or to bring down to date their professional knowledge in those branches of medicine required in civilian practice. Accordingly, after consultation between the Ministry of Health, the universities and other interested bodies, arrangements are being made by which officers on release will avail themselves of further training or refresher facilities.

The following are the classes of officers concerned: 1. Those who joined the forces within a year or so of obtaining a medical qualification, including those who would have proceeded further to take a university medical degree but were prevented by recruitment from doing so. 2. Those who had become established in general practice before joining the forces. 3. Those who were training for a specialist career when they joined the forces or are accepted as suitable for such training on release. Class 1 will be offered salaried resident posts for up to six months at teaching hospitals or other hospitals approved by the universities, where they will have access to suitable clinical material and work under the guidance of senior members of the visiting staffs. For class 2 refresher courses will be arranged at hospitals approved by the universities. For class 3 there will be posts of the "registrar" type in teaching and other hospitals approved by the universities, where they can continue their specialist training.

The posts available to class 1 will carry a salary of $1,750 plus board and lodging. For those with family commitments further assistance will be available. The refresher courses for class 2 will be free of cost. Traveling and subsistence expenses, together with the expense of a locum tenens when necessary, will be repayable up to a specified maximum. The posts available for class 3 will carry a salary of $2,750 plus board and lodging.

Typhus Causes a Truce

By negotiations between British and German officers, British troops took over from the S. S. and the Wehrmacht the task of guarding the vast concentration camp at Belsen, a few miles northwest of Celle, which contains 60,000 prisoners, many of them political. This has been done because typhus is rampant in the camp and it is vital that no prisoners be released until the infection is checked. The advancing British agreed to refrain from bombing or shelling the area of the camp, and the Germans agreed to leave behind an armed guard which would be allowed to return to their own lines a week after the British arrival. The story of the negotiations is curious. Two German officers presented themselves before the British outposts and explained that there were 9,000 sick in the camp and that all sanitation had failed. They proposed that the British should occupy the camp at once, as the responsibility was international in the interests of health. In return for the delay caused by the truce the Germans offered to surrender intact the bridges over the river Aller. After brief consideration the British senior officer rejected the German proposals, saying it was necessary that the British should occupy an area of 10 kilometers round the camp in order to be sure of keeping their troops and lines of communication away from the disease. The British eventually took over the camp.

Medical Delegations to Britain from Liberated Europe

It was stated in a previous letter (THE JOURNAL, March 10, p. 610) that the doctors and scientists of liberated Europe are eagerly looking to Britain for a cultural lead to replace the hegemony hitherto exercised by Berlin. Signs of this movement are already evident. A French medical delegation is now visiting this country as guests of the British Council and the Royal College of Physicians. Representing the Académie de médecine is Prof. A. Baudouin, dean of the Faculté de médecine, Paris, Prof. A. Lemierre and Dr. P. F. Armand-Delille; the Conseil supérieur de médecine, Dr. Ravina, Dr. A. Laporte and Dr. H. Descomps; the provinces, Prof. C. Soula of Toulouse, Professor Gernez-Rieux of Lille, Prof. J. Roche of Marseilles and Dr. M. Nédelec of Angers. During the blight of the German occupation of France not only did all progress in medicine and science cease but the country was cut off from the outside world, so that advances made remained unknown. Even foreign medical journals could not be obtained.

Arrangements have also been made for the visit to Britain of four groups of Belgian professors in the next three months. The first group will be here from April 16 to 30 and will include N. Goormaghtigh of Ghent and Prof. P. Govaerts of Brussels.

SWITZERLAND

(From Our Regular Correspondent)

GENEVA, April 15, 1945.

Swiss Tropical Institute

It is now one year since the Swiss Tropical Institute was founded in Basle. It has witnessed a considerable development under the direction of its president, Professor R. Geigy. There are now more than a hundred students following different courses on tropical subjects. A special section has been created for the documentation and the bibliography of all tropical matters. This section serves scientists or businessmen by furnishing required information about publications concerning the tropics. The library is enlarging every day and comprises at present four hundred books, fifty periodicals and more than a thousand pamphlets, articles and other items. The institute also publishes a review, the *Acta tropica,* of which four issues appeared in 1944. The institute has created, at the Basle Auxiliary Hospital, a special section for tropical diseases. The immediate purpose of this clinic, which is under the direct control of the institute, was to receive Italian and Yugoslavian military internees suffering from malaria. During the last six months of 1944, 163 patients were treated. The observations made enabled the doctors and students to start research on hematology, serology and medical entomology. The director of the clinic is Dr. A. Perret-Gentil, medical adviser of the institute, assisted by Dr. M. Lauterburg-Bonjour.

The Fight Against Cancer

It is estimated that 1 person out of 7 dies of cancer in Switzerland. Therefore the Swiss Association for the Fight Against Cancer has started a vast propaganda action throughout Switzerland to make people conscious of the danger of the disease. To give to this action the greatest efficiency, the association has had a documentary film made about cancer. The film was done with the help of Swiss specialists and the laboratories of medical schools. It enables the public to witness operations at which only doctors are usually present. The actor

Biberti, who impersonates a professor of pathology, explains to his students (and therefore for the public in the cinema) the theories concerning cancer and the different therapeutic methods now in use. The film lasts one hour, and the audience can become acquainted with the appearance of different kinds of cancer and the stages of their evolution. It shows the principal methods of treatment: removal of the cancer focus, destruction of the cancer cells with roentgen rays and radium therapy. As it is essential for a good prognosis to be able to diagnose very early the formation of a focus, the film emphasizes the value of a complete medical examination at least once a year.

Center for Types of Bacteria in Lausanne

A special laboratory has just been established at the Institute for Hygiene and Bacteriology of the Lausanne Medical School where specimens of all organisms pathogenic for man, animals and plants will be kept. This laboratory will function with the help of well known Swiss and foreign workers, and the specimens will be sent to any doctor doing research who asks for them. A detailed catalogue will help him to choose the exact variety of germs he wishes to have. The Swiss Academy of Medical Sciences has given its approval to this new center, and Dr. P. Hauduroy, professor of bacteriology, has been appointed as its director.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, April 18, 1945.

Observations on the BCG Immunization Campaign

The campaign for the immunization of Rio de Janeiro infants against tuberculosis by the BCG vaccine under the direction of Dr. Arlindo de Assis has been reported in several previous letters. Dr. Assis has just published a general report of his work begun in 1927, which includes, up to 1944, a total of 161,152 immunized children. At the same time the report includes the vaccination of more than 3,000 anallergic persons of other age groups. The immunizing strain used was obtained in 1927 from Dr. E. Moreau of Montevideo, Uruguay, the material having been originally furnished by Dr. Calmette from the Pasteur Institute in Paris. As a rule the immunizations were performed through the ingestion of the material, but in some cases subcutaneous and intradermal inoculations were used as well. In 1934 Dr. Assis began to immunize anallergic children of preschool and school ages, for which he used the total dose of 10 centigrams. All this immunization work has been accompanied by extensive laboratory researches, which in part have been reported in previous letters.

The Moreau strain of BCG, studied in animals since 1925 and in human beings since 1927, has maintained, up to now, the original attenuated virulence and the capacity of producing tuberculin and tuberculinic allergy. When killed by heat and administered intradermally to nontuberculous individuals in the dosage of one tenth of a milligram, the strain may cause minimal nodules, sometimes followed by suppuration or transient local caseation, associated or not with late tuberculinic allergy (after the third week). Sometimes it may stimulate only the appearance of this late tuberculinic allergy, without the production of local nodules. In about 45 per cent of the cases it may cause no change at all. The same dosage of killed BCG, in tuberculous patients during the preallergic stage, or in tuberculinized individuals who have already lost their allergy, or in BCG immunized individuals also apparently anallergic, the intradermal inoculation shows a quite different picture, causing the early appearance of intense nodular reaction and the state of cutaneous tuberculinic allergy during the first week. This ability to produce what Dr. Assis calls "infratuberculinic allergy" (THE JOURNAL, Nov. 28, 1942, p. 1053) is comparatively stronger than the same effect caused by the common human virulent tubercle bacillus.

A High Standard School of Nursing

A new high standard school of nursing has been founded in Nicteroy, state of Rio de Janeiro. This is the third nursing school of this type in Brazil and the second one founded with the cooperation of the Special Service of Public Health. As reported in a previous letter (THE JOURNAL, Aug. 14, 1943, p. 1140), a school of nursing of high standard was founded in June 1943 in connection with the University of São Paulo. For the establishment of this school the Special Service made large contributions. It is interesting to point out that the first school of nursing of high standard—the one now belonging to the University of Rio de Janeiro—was founded in 1923 with the cooperation of a mission of American nurses supported by the International Health Board of the Rockefeller Foundation.

Dr. Leo Eloesser

Dr. Leo Eloesser, professor of Surgery at the Stanford University, spent a few days in Rio de Janeiro, commissioned by the Rockefeller Foundation to study some aspects of surgery and its teaching in Brazil and in other South American countries. Dr. Eloesser visited the department of surgery of the Hospital Moncorvo Filho, under the direction of Dr. Alfredo Monteiro, where he delivered a lecture on the modern evolution of pulmonary surgery. He was also received at the Brazilian College of Surgeons and at the Brazilian Tuberculosis Association, where he spoke respectively on war surgery of the thorax and on the treatment of tuberculous lung cavities.

American Penicillin in Brazil

The use of penicillin is rapidly developing in Brazil, although the drug is mainly distributed as a solution, the form in which it is prepared and furnished by the Institute Oswaldo Cruz of Rio de Janeiro. However, since June of last year American dried sodium penicillin has been available. To insure the regular distribution of the drug throughout the whole country, a control of the use was established by the National Health Department, but this measure is being suspended gradually, as the importation of American penicillin has increased rapidly.

Personal

Dr. Hercilio Marroco has been appointed president of the Sociedade Medica São Lucas for 1945-1946.

Dr. Antonio Murtinho Nobre, well known Brazilian homeopathist, died suddenly in Rio de Janeiro on April 1, aged 66.

Dr. Eurico Branco Ribeiro, director of Sanatorio São Lucas of São Paulo, has been elected corresponding member of the Academia de Letras do Paraná.

Marriages

BENJAMIN FRANKLIN MONTAGUE Jr., Charleston, W. Va., to Miss Mary Louise Aylor of Chatham, Va., March 3.

WILLIAMS McIVER BRYAN Jr., Cleveland, to Miss Anne (Nancy) Gantt Snowden of Columbia, S. C., April 10.

THEOPHILUS HENRY BOYSEN III, Egg Harbor, N. J., to Miss Jean Danaher of Philadelphia, February 10.

HARRY EUGENE EZELL Jr., Corsicana, Texas, to Miss Miriam Jordan Akin of Franklin, Tenn., March 9.

ROBERT DUDLEY PILLSBURY, Omaha, to Miss Margaret Jane Schwab of Washington, D. C., January 27.

FRANCIS A. MARZONI, Durham, N. C., to Miss Florence Dick of Paris, Ky., in Durham, April 6.

LEO M. BASHINSKY, Durham, N. C., to Miss Betty Louise Riddle in Burlington, April 1.

HAROLD D. HILL to Miss Marjorie Ellen McCain, both of Richmond, Ind., February 11.

JOSEPH D. BELLEVILLE to Miss Marilyn Scott, both of St. Louis, March 1.

Deaths

Martin Henry Dawson, New York; McGill University Faculty of Medicine, Montreal, Que., Canada, 1923; instructor in pathology and bacteriology at the University of Louisville School of Medicine, Louisville, Ky., 1924-1925; in 1926 joined the Rockefeller Institute, New York, as research fellow, becoming an assistant in 1928; later served as associate professor of clinical medicine at the Columbia University College of Physicians and Surgeons; associate physician at the Presbyterian Hospital; won the military cross for service during World War I as a captain in the Trench Mortar Battery of the Canadian army; specialist certified by the American Board of Internal Medicine; member of the Association of American Physicians, American Society for Clinical Investigation, American Rheumatism Association, American Association of Pathologists and Bacteriologists, American Society for Experimental Pathology and the Society of American Bacteriologists; executive secretary of the International Congress on Microbiology and editor of its transactions; during World War II director of the Commission on Streptococcal Infections under the War Department and consultant on infectious diseases to the Secretary of War; directed a comparative research program which included the treatment of bacterial endocarditis with penicillin and the use of gold salts in the treatment of rheumatoid arthritis; said to be first in the United States to prepare and use penicillin for treatment of human beings; research included infectious diseases, the transmutation of strains of pneumococci and biologic variants of the streptococcus and other microorganisms and the nature and treatment of arthritis; died in the Harkness Pavilion, Columbia-Presbyterian Medical Center, April 27, aged 48.

Milton Weston Hall ✠ Lieutenant Colonel, U. S. Army, retired, Palma Sola, Fla.; S.B., Massachusetts Institute of Technology, in 1900; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; Army Medical School, advanced course, 1921; served during World War I; entered the medical corps of the U. S. Army as a major in 1920; promoted to lieutenant colonel in August 1937; retired Jan. 31, 1942; was placed on active duty Feb. 1, 1942, serving as associate professor of military science at the State University of Iowa College of Medicine, Iowa City; returned to the inactive retired list about April 15, 1944; member of the Medical Association of the Isthmian Canal Zone, American Society of Tropical Medicine and the Association of Military Surgeons of the United States; his service included three years' work on dengue fever with the research board on tropical diseases in the Philippines and with General Hospital laboratories in this country and in Panama; died March 26, aged 67, of myocardial insufficiency, influenza and arteriosclerosis.

Marion Whitmell Ransone ✠ Captain, U. S. Army, retired, Washington, D. C.; Medical College of Virginia, Richmond, 1926; interned at the Walter Reed General Hospital; Army Medical School and Medical Field Service School in 1928; served during World War I; entered the medical corps of the U. S. Army as a first lieutenant in August 1927; promoted to captain in August 1929; retired on April 30, 1937 for disability in line of duty; assistant professor of pathology at the Georgetown University School of Medicine; on the staffs of the Georgetown University and Gallinger Municipal hospitals; died in the Alexandria Hospital, Alexandria, Va., March 17, aged 47, of coronary thrombosis.

Robert DuVal Jones, New Bern, N. C.; University of Maryland School of Medicine, Baltimore, 1896; member of the American Medical Association and the Southern Surgical Association; served as president of the North Carolina Hospital Association and as district president of the Medical Society of the State of North Carolina; fellow of the American College of Surgeons; a lieutenant commander in the U. S. Navy serving overseas during World War I; at one time county physician; formerly associated with the U. S. Public Health Service; manager of St. Luke's Hospital, in which he was part owner until he retired; died March 2, aged 71, of heart disease.

John McEwen Foster, Denver; University of Tennessee Medical Department, Nashville, 1891; member of the American Medical Association and the American Laryngological, Rhinological and Otological Society; honorary member of the Colorado State Medical Society; fellow of the American College of Surgeons; specialist certified by the American Board of Otolaryngology; professor of otolaryngology emeritus at the University of Colorado School of Medicine; member of the consulting staff, St. Luke's Hospital; consulting ophthalmologist at the Children's Hospital; died March 24, aged 84, of cardiorenal failure and anemia.

Henry Clarence Lochte, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1914; served as instructor in clinical medicine at his alma mater; an officer in the medical corps of the U. S. Army during World War I; for many years associated with the bureau of war risk insurance of the Veterans Administration; formerly assistant bacteriologist for the city board of health; chief of the outpatient division at the Veterans Administration Facility in Bay Pines, Fla., from 1933 to 1938, when he retired; died March 25, aged 53, of hypertensive cardiovascular disease.

Andrew John Aird, Carterville, Ill.; Barnes Medical College, St. Louis, 1898; served during World War I; died in the Veterans Administration Facility, Marion, Ind., March 15, aged 77, of hypertensive heart disease.

Einer Bjarne Andersen ✠ Iron Mountain, Mich.; University of Michigan Medical School, Ann Arbor, 1919; fellow of the American College of Surgeons; secretary-treasurer of the Dickinson-Iron Counties Medical Society; staff member, Iron Mountain General Hospital; died April 22, aged 52, of heart disease.

Robert Bailin, Brooklyn; New York Homeopathic Medical College and Flower Hospital, New York, 1917; member of the American Medical Association; died February 12, aged 52.

Will Lake Beach ✠ Painesville, Ohio; Ohio State University College of Medicine, Columbus, 1920; died March 13, aged 54.

Aubry C. Belcher, Richmond, Va.; Medical College of Virginia, Richmond, 1916; member of the American Medical Association; died February 18, aged 55.

Stephen Albert Bergin, Worcester, Mass.; Harvard Medical School, Boston, 1900; member of the American Medical Association; obstetrician at St. Vincent Hospital, where he died February 21, aged 72, of arteriosclerotic heart disease, chronic nephritis and diabetes mellitus.

Abram Louis Blanding, Fountain Inn, S. C.; University of Maryland School of Medicine, Baltimore, 1881; died February 25, aged 86.

George Dorsey Boone, Erin, Tenn.; University of Nashville Medical Department, 1899; served as mayor of the town of Erin; died in the Nobles Memorial Hospital, Paris, March 6, aged 73, of cerebral hemorrhage.

Albert Ubald Bourcier, Springfield, Mass.; University of Montreal Faculty of Medicine, Montreal, Que., Canada, 1927; member of the New England Society of Psychiatry; captain in the medical corps, Army of the United States, from Aug. 21, 1942 until Nov. 28, 1942, when he was relieved from duty; served on the staffs of the Northampton State Hospital and the Cooley Dickinson Hospital, Northampton, and the Mercy Hospital, where he died March 5, aged 47, of skull fracture and subdural hemorrhage caused by a fall.

Augustus A. Bradley, Cookeville, Tenn.; University of Tennessee Medical Department, Nashville, 1901; member of the American Medical Association; died February 15, aged 78.

Devillo N. Bulson, Rockville Centre, N. Y.; Eclectic Medical College of the City of New York, 1886; member of the board of education; one of the members of the board of trustees who founded the Rockville Centre Public Library; founder and for many years president of the Nassau County National Bank; died March 22, aged 89, of heart disease and pneumonia.

William Taylor Center ✠ Hazel Green, Ky.; Hospital College of Medicine, Louisville, 1907; died February 25, aged 63.

Peter David Cholodny, Elizabeth, N. J.; Universität Leipzig Medizinische Fakultät, Saxony, Germany, 1921; plant physician for the U. S. Metals Refining Company at Carteret; interned at the Alexian Brothers Hospital, where he died March 4, aged 51, of coronary thrombosis.

John William Christensen, Dayton, Ohio; Milwaukee Medical College, 1902; served during World War I; served on the staff of the Veterans Administration Facility, where he died March 18, aged 70, of coronary occlusion due to hypertensive heart disease.

John Henry Francis Connor, Wrentham, Mass.; College of Physicians and Surgeons, Boston, 1907; assistant physician at the Wrentham State School; for many years an examiner for the Massachusetts Boxing Commission; died March 8, aged 63.

Francis M. Corry, Menasha, Wis.; Milwaukee Medical College, 1900; died in St. Elizabeth Hospital, Appleton, April 7, aged 69, of coronary thrombosis.

Frank Adams Daugherty, Independence, Ky.; University of Louisville School of Medicine, 1925; member of the American Medical Association; interned at the Good Samaritan Hospital in Cincinnati; a member of the Students Advanced Training Corps during World War I; on the courtesy staff of the William Booth Memorial Hospital in Covington, where he died March 16, aged 47, of malignant hypertension.

John Franklin Davis ⊕ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; served in the medical corps of the U. S. Army during World War I; for many years physician for the Chicago Bears football and the Cubs baseball teams; surgeon for the Rapid Transit Lines; member of the attending staff of the Illinois Masonic Hospital, where he died April 6, aged 69, of bundle branch block and coronary thrombosis.

William Eugene Dickinson, Canistota, S. D.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; served during World War I; veteran of the Spanish-American War; died January 28, aged 67.

John Wesley Dill, Los Angeles; University of Michigan Homeopathic Medical School, Ann Arbor, 1879; Civil War veteran; died April 2, aged 102, of pneumonia.

Abraham Wilson Dods, Fredonia, N. Y.; the Hahnemann Medical College and Hospital, Chicago, 1878; member of the American Medical Association; examining physician for the local draft board during World War I; an honorary member of the Rotary Club, the Fredonia chamber of commerce, of which he served once as president, and the Chautauqua County Medical Association; served as surgeon at the Brooks Memorial Hospital, Dunkirk, and with the New York Central Railroad Company; died April 6, aged 91, of senility.

William Evans ⊕ West Chester, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1885; served as physician at the Pennsylvania Industrial Home for Blind Women and the Home for Aged and Infirm Colored Persons; member of the board of directors of the Elwyn Training School in Elwyn, and the Y. M. C. A. in West Chester; member of the College of Physicians of Philadelphia; died in the Chester County Hospital March 18, aged 83, following a prostatectomy.

Carlos Sager Fenton, North Bloomfield, Ohio; University of Wooster Medical Department, Cleveland, 1891; died March 15, aged 79.

George Horace Gilbert, Austin, Texas; University of Texas School of Medicine, Galveston, 1903; member of the American Medical Association; served during World War I; died in St. David's Hospital February 17, aged 65, of encephalitis.

Heber M. Goodsmith, Evanston, Ill.; College of Physicians and Surgeons of Chicago, 1887; formerly member of the medical staff of the Metropolitan Life Insurance Company and medical director of the Illinois Bell Telephone Company in Chicago; died April 9, aged 79, of chronic myocarditis.

George DeWayne Hallett, New York; New York Homeopathic Medical College and Hospital, New York, 1889; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the staffs of the Jamaica Hospital, Jamaica, and the Flower and Fifth Avenue Hospitals; died March 14, aged 78, of heart disease.

William C. Harris, Lawrenceburg, Tenn. (licensed in Tennessee in 1889); died in Nashville March 6, aged 86, of cerebral hemorrhage.

Robert Galloway Henderson ⊕ Memphis, Tenn.; Memphis Hospital Medical College, 1900; died February 9, aged 69.

Clare Fredric Hoover ⊕ Topeka, Kan.; Kansas Medical College, Topeka, 1899; on the staffs of the Stormont Hospital and Christ's Hospital, where he died February 9, aged 70, of auricular fibrillation and gangrene of the leg from embolism.

Walter Dennis Hough, Los Angeles; New York Homeopathic Medical College, New York, 1881; Long Island College Hospital, Brooklyn, 1883; died January 13, aged 86.

William C. Hunt, Rochester, Ky.; University of Louisville Medical Department, 1889; died in Browder March 26, aged 86, of angina pectoris.

Andrew Jackson Hunter, Eureka, Mont.; the Hahnemann Medical College and Hospital, Chicago, 1883; died January 26, aged 93, of arteriosclerosis.

Martin Bushnell Jelliffe ⊕ Springfield, Ill.; University of Illinois College of Medicine, Chicago, 1917; served during World War I; interned at the Cook County Hospital in Chicago; on the staffs of the Memorial Hospital and St. John's Hospital, where he died March 5, aged 55, of diabetes mellitus and coronary occlusion.

Brinley John, Morgantown, W. Va.; Jefferson Medical College of Philadelphia, 1924; member of the American Medical Association; served as president of the Monongalia County Medical Society in 1935; interned at the South Side Hospital in Pittsburgh; died April 21, aged 45, of coronary thrombosis.

Joseph Frasia Jones, Richmond, Va.; Medical College of Virginia, Richmond, 1906; member of the American Medical Association; at one time demonstrator of anatomy at his alma mater; formerly assistant surgeon for the Seaboard Air Line Railway; on the staff of the Johnston-Willis Hospital; died March 11, aged 66, of coronary occlusion.

Edward F. Katzman, Louisville, Ky.; Louisville Medical College, 1902; member of the American Medical Association; died in St. Joseph Infirmary March 15, aged 64, of hypertensive heart disease.

Joseph Lemuel Kershner, Effingham, Ill.; Marion-Sims College of Medicine, St. Louis, 1892; died in St. Anthony's Hospital March 13, aged 86, of chronic cardiovascular sclerosis.

Emanuel Klaus ⊕ Cleveland; Western Reserve University Medical Department, Cleveland, 1902; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; served in the medical corps of the U. S. Army during World War I; executive secretary of the International Anesthesia Research Society and member of other associated groups; member of the staff of the Lutheran Hospital, where he died March 21, aged 69, of arteriosclerotic heart disease and pulmonary infarction.

Oscar Kenneth Lang, New York; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1906; died March 10, aged 63.

Henry Austin Macheca, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1921; served on the teaching staffs at his alma mater and the Louisiana State University Medical Center; interned at the Touro Infirmary, where he served on the staff; formerly on the staff of the Charity Hospital; died March 19, aged 48, of heart disease.

Arthur Morgan MacWhinnie, Seattle; Baltimore Medical College, 1897; member of the Pacific Coast Oto-Ophthalmological Society; died February 28, aged 70, of arteriosclerosis and cardiorenal disease.

Anna Manning, Jersey City, N. J.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1893; died February 7, aged 85.

Edward Earl Marsh, Wilkes-Barre, Pa.; Medico-Chirurgical College of Philadelphia, 1916; member of the American Medical Association; served during World War I; died January 25, aged 51.

Lewis Martin, Newton, Ill.; Eclectic Medical Institute, Cincinnati, 1894; died February 12, aged 85.

John George Maurer ⊕ Saginaw, Mich.; Saginaw Valley Medical College, 1902; died March 9, aged 67, of coronary occlusion.

Charles F. Mayer, Burr, Neb.; John A. Creighton Medical College, Omaha, 1904; member of the American Medical Association; on the courtesy staff of the Bryan Memorial Hospital, Lincoln, where he died January 23, aged 65.

William Hayes McCarty, Marion, Va.; Medical College of Virginia, Richmond, 1924; member of the American Medical Association and the American Psychiatric Association; served during World War I; interned at the George Ben Johnston Memorial Hospital, Abingdon; for many years a member of the staff of the Southwestern State Hospital; died January 26, aged 47.

Robert Lane McCrady ⊕ Charleston, S. C.; Medical College of the State of South Carolina, Charleston, 1912; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; professor of gynecology and obstetrics and member of the library committee and advisory committee to the dean at his alma mater; member of the board of commissioners and surgical staff of the Roper Hospital; found in the creek near his summer cottage on James Island, April 3, aged 55.

Thomas Francis McDermott, New York; Medical College of Virginia, Richmond, 1924; on the staff of St. Vincent's Hospital; died February 11, aged 52.

Herbert Edmund McLean ✠ Jersey City, N. J.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1923; on the staff of the Christ Hospital; died January 9, aged 47.

Caleb Gleni McNaul, Altoona, Pa.; Jefferson Medical College of Philadelphia, 1890; served as medical inspector in the Juniata schools for twenty years; died in the Altoona Hospital January 21, aged 79.

Archie Levy Oberdorfer, New York; University of Virginia Department of Medicine, Charlottesville, 1901; member of the American Medical Association; served on the staffs of the Mount Sinai and Harlem Eye and Ear hospitals; died March 12, aged 67.

James C. Paxson, Charleston, Ill.; Medical College of Ohio, Cincinnati, 1883; died in the M. A. Montgomery Memorial Sanitarium March 9, aged 89, of toxemia and carcinoma of the penis.

Thorvald Petersen ✠ Minneapolis; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1911; fellow of the American College of Surgeons; member of the surgical staff of the Fairview Hospital; died January 22, aged 62, of cerebral thrombosis.

Fred Saul Richmond, Bluefield, W. Va.; University of Louisville Medical Department, Louisville, Ky., 1911; member of the American Medical Association; died in the Bluefield Sanitarium April 9, aged 61, of cerebral hemorrhage.

Hugh Fay Ringo, Milwaukee; University of Louisville Medical Department, Louisville, Ky., 1907; member of the American College of Chest Physicians; died February 7, aged 60.

Douglas H. Roberts, Lincoln, Neb.; Lincoln Medical College of Cotner University, 1896; for many years president of the board of education and formerly mayor of Bethany; died February 4, aged 84.

Samuel Jacob Schwaup, Osborne, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1906; member of the American Medical Association; died February 4, aged 65.

Claude Martin Walker ✠ Kellerton, Iowa; St. Louis College of Physicians and Surgeons, 1898; served as a member of the board of health; died in March, aged 71, of carcinoma.

John Alexander Williams, Walton, Fla. (licensed in Indiana in 1899); for many years a practitioner in Fort Wayne, Ind.; died February 16, aged 83, of chronic valvular heart disease and generalized anasarca.

LIEUT. WALTER GEORGE EPPLY
(MC), U.S.N.R., 1916-1944

LIEUT. AKIN MATHIEU
(MC), U.S.N.R., 1917-1944

CAPT. ORVILLE DONALD THATCHER
M. C., A. U. S., 1913-1944

Daniel Warren Poor, Narrowsburg, N. Y.; College of Physicians and Surgeons, New York, 1894; associated with the department of health of New York City for more than twenty-five years, retiring in 1929 as assistant director of the bureau of laboratories; died March 29, aged 75.

Julius Wollitzer ✠ Johnstown, Pa.; University of Kolozsvar, Hungary, 1906; interned at St. Luke's Hospital in Bethlehem; a captain in the Hungarian army medical corps during World I; died in the Conemaugh Valley Memorial Hospital February 11, aged 64, of carcinoma of the sigmoid.

KILLED IN ACTION

Walter George Epply, Manchester, N. H.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1941; interned at the Vancouver General Hospital, Vancouver, B. C., Canada; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on Aug. 7, 1942; left the United States about June 20, 1943; spent some time in New Caledonia; on Aug. 14, 1943 assigned to the U. S. S. *President Adams;* promoted to lieutenant on Oct. 1, 1943; awarded the Silver Star Medal posthumously; the citation accompanying the award read "for conspicuous gallantry and intrepidity as officer in charge of the medical section of a beach party during the assault on enemy Japanese-held Asan Point, Guam, Marianas Islands, on July 21, 1944"; he was killed in the action for which he received the medal, aged 27.

Akin Mathieu, Portland, Ore.; University of Oregon Medical School, Portland, 1942; served an internship at the Robert Packer Hospital, Sayre, Pa.; commissioned a lieutenant (jg) in the medical corps, U. S. Naval Reserve, on June 12, 1942; promoted to lieutenant on Nov. 1, 1944; died in the Asiatic area Oct. 25, 1944, aged 27, of extreme multiple injuries.

Orville Donald Thatcher, Fort Dodge, Iowa; State University of Iowa College of Medicine, Iowa City, 1937; interned and served a residency at the University Hospitals, Iowa City; member of the American Medical Association; commissioned a first lieutenant in the medical corps, Army of the United States, on June 29, 1942; began active duty on July 11, 1942; a flight surgeon assigned to the 386th Bombardment Group (M) of the Ninth Air Force based in England; promoted to captain; awarded the Purple Heart posthumously; killed in action in France June 22, 1944, aged 31.

Correspondence

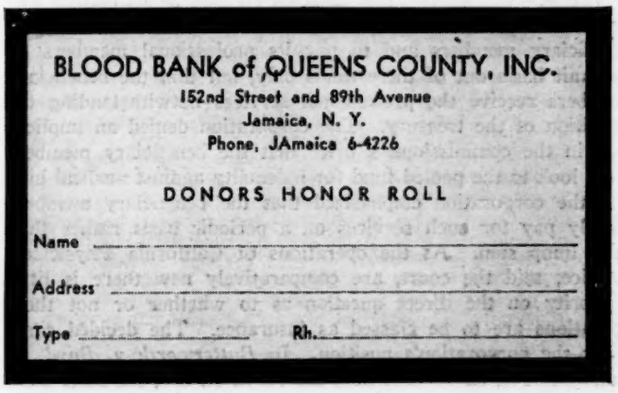
IDENTIFICATION CARD FOR BLOOD DONORS

To the Editor:—As director of the Blood Bank of Queens County it seems to me quite necessary that every person should know his blood type and Rh factor and carry a card with the information on his person at all times.

In the work we started here in 1942 we have typed more than 5,000 people in and around Queens County. Several large business concerns have a list of these types in their files so that in an emergency one or more compatible donors may be sent to the hospital when the patient is admitted.

We have determined the Rh factor on the last 2,000 and have a voluntary list of 185 Rh negative donors of all types available on call for emergencies.

All persons typed have in addition to their own type and Rh factor the names of six persons of their acquaintance of the same type and Rh factor on their identification card. All of this saves valuable time at the critical moment and does away with the unnecessary confusion and loss of time trying to locate a donor of the proper type.


BLOOD BANK of QUEENS COUNTY, INC.
152nd Street and 89th Avenue
Jamaica, N. Y.
Phone, JAmaica 6-4226

DONORS HONOR ROLL

Name _____

Address _____

Type _____ Rh. _____

Identification card, showing blood type and Rh factor. On the back of the card, under the heading "Persons of My Type and Rh Factor," are blank lines for six names.

This is a nonprofit organization and all blood and plasma is given free on the replacement plan of two donors for each unit when we can get it. No patient is denied blood or plasma regardless of ability to send in replacements.

We are doing a typing program for the New York City Police Department so that it may have in addition to its regular typing list a list of Rh negatives of all types.

Such a plan as this could be adopted nationally by the Red Cross as a postwar project.

We are soon to start an enlarged program of this kind in Brooklyn under the auspices of the Kings County Medical Society.

EDWARD J. MADDEN, Jamaica, N. Y.

PRIORITY IN REFRIGERATION

To the Editor:—The paper of Blakemore and his collaborators in THE JOURNAL, March 24, continues the misstatement of their former publication (*Ann. Surg.* **117**:481 [April] 1943) crediting the introduction and demonstration of the refrigeration principle to Brooks and Duncan. The following facts should scarcely be overlooked: (*a*) The prior work of F. M. Allen was acknowledged in the very paper of Brooks and Duncan which Blakemore et al. cite, and Allen's experiments were much greater in number and scope and are well known as the origin of current interest in this method. (*b*) The Brooks and Duncan experiments have subsequently been interpreted (Brooks, discussion, *Ann. Surg.* **115**:626 [April] 1942. Large and Heinbecker, *ibid* **120**:707 [Nov.] 1944) as adverse to the preservation of tissue demonstrated by Allen and with emphasis on alleged destructive effects of cold, thus making the position of Blakemore et al. all the more unreasonable. (*c*) Allen has recently (*Arch. Phys. Med.* **26**:92 [Feb.] 1945) pointed out the errors in the methods and interpretation of the Brooks-Duncan and Large-Heinbecker experiments and interpretations. This treatment of the recorded literature is called to attention because of my impression that it is not an isolated incident.

LYMAN WEEKS CROSSMAN, M.D., New York.

CENTENARY CELEBRATION OF LAWSON TAIT

To the Editor:—Lawson Tait was born on May 1, 1845. Arrangements are being made in Birmingham, England, where his life's work was done, to celebrate his centenary in 1945.

We should be grateful for any matter of interest concerning Lawson Tait from American medical men, many of whom visited him at the Crescent, Birmingham, in the latter years of last century and by whom credit for his pioneer work in abdominal surgery was generously given.

It is hoped to arrange a meeting of the profession in Birmingham and perhaps also to arrange a small exhibition representative of his life and writings.

FAUSET WELSH.
F. SELBY TAIT.
Birmingham Medical Institute,
154, Great Charles Street, Birmingham 3.

Honorary Secretaries, Midland Medical Society
Section of the Birmingham Medical Institute.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Service Plans Not Insurance nor the Corporate Practice of Medicine.—California Physicians' Service was incorporated as a nonprofit membership corporation in 1939 under the applicable laws of California. It is composed of beneficiary members, professional members and administrative members. A beneficiary member is entitled on the payment of stated monthly dues and when the necessity for medical or surgical service for him arises to select any professional member to render those services to him at the cost of the corporation. Professional members are such physicians as agree to abide by the rules of the corporation, and any physician licensed to practice medicine in California is eligible to become a professional member. A professional member agrees that in return for the services he renders a beneficiary member he will accept compensation "upon a pro rata basis out of the monthly funds collected from the beneficiary members." The administrative members comprise physicians and others in whom is vested the administrative control of the corporation. Shortly after its incorporation the corporation undertook to operate a medical service plan throughout the state. In 1941 a law was enacted in California (Civil Code, Sec. 593a) which, in effect, authorized the organization and operation of a corporation such as the California Physicians' Service if, among other things, one fourth of the licensed physicians in the state became professional

members and if the corporation was licensed by the Board of Medical Examiners.[1] Following the enactment of this law the corporation obtained a license from the board of medical examiners. Nevertheless the insurance commissioner believed it necessary for the corporation to qualify under the insurance laws of the state and apparently threatened legal action. Thereupon the corporation instituted against the insurance commissioner an action for a declaratory judgment that its operations did not "constitute insurance under the supervision of the commissioner nor the corporate practice of medicine." There was a judgment for the corporation, and the commissioner appealed to the district court of appeal, first district, division 2, California.

The insurance commissioner contended, first, that the corporation was illegally engaged in the practice of medicine, citing *Painless Parker* v. *Board of Dental Examiners,* 216 Cal. 285, 14 P. (2d) 67; *People ex rel. State Board of Medical Examiners* v. *Pacific Health Corporation,* 12 Cal. (2d) 156, 82 P. (2d) 429, 119 A. L. R. 1284; *Benjamin Franklin Life Assur. Co.* v. *Mitchell,* 14 Cal. App. (2d) 654, 58 P. (2d) 984, which cases hold that a corporation may not lawfully engage in the practice of law, medicine or dentistry. The corporation did not dispute the rule enunciated in those cases, but it contended that its practices were expressly sanctioned by the 1941 law previously referred to. It also relied on certain statements in the *Pacific Health Corporation* case, supra. There it was said that the rule prohibiting the corporate practice of medicine did not apply to the furnishing of medical services to members by fraternal, religious, hospital, labor and similar benevolent organizations. That case further said that the distinguishing feature was whether an association or corporation was organized for profit. Further, in the words of the court in that case the activities of these nonprofit organizations were "not comparable to those of private corporations operated for profit and, since the principal evils attendant upon corporate practice of medicine spring from the conflict between the professional standards and obligations of the doctors and the profit motive of the corporation employer, it may well be concluded that the objections of policy do not apply to nonprofit institutions. This view almost seems implicit in the decisions of the courts, and it certainly has been the assumption of the public authorities, which have, as far as we are advised, never molested these organizations." In answer, the commissioner argued that the law relied on by the corporation cannot have the effect of validating its activities since it merely authorized the incorporation for the purposes stated whereas the California Physicians' Service was organized two years prior to the enactment of the law. If this case, answered the court, involved prosecution for the acts committed before the statute was passed there would be some merit in the argument. But it is concerned only with a declaration of the right of respondent to continue under the section free from the supervision of the insurance commissioner. Since it is conceded that the legislature intended the statute to apply to California Physicians' Service, it is a fair inference that the legislature had some knowledge of the practice and mode of operation of the corporation and hence the legislative intent was to permit the respondent to continue in those activities under the terms of the law it enacted.

The insurance commissioner contended, finally, that California Physicians' Service was engaged in the insurance business and hence subject to his supervision and control. In answer, the corporation argued that, first, its method of operation is not that of insurance and, secondly, if it is insurance the corporation is not subject to the supervision of the commissioner. Insurance, said the court, is defined in section 22 of the Insurance Code as "a contract whereby one undertakes to indemnify another against loss, damage or liability arising from a contingent or unknown event." St. 1935, p. 498. It is defined in 29 Am. Jur. p. 47 as "an agreement by which one person for a consideration promises to pay money or its equivalent, or to perform some act of value, to another on the destruction, death, loss or injury of someone or something by specified perils." The commissioner cited no authority directly in point. He argued that the obligation to the beneficiary members assumed by California Physicians' Service looks like insurance and should be so interpreted. On the other hand, the corporation argued that it is similar to a producer-consumer cooperative organization, that it does not indemnify or compensate for the cost of an illness or injury, that it does not assume any risk, that its professional members do not assume any risk and that the beneficiary members do not receive any indemnity or compensation. The corporation emphasized that its obligation was that of an agent to collect and administer funds collected from beneficiary members and to pay its professional members on the unit basis out of these funds only, but that the beneficiary members receive the professional services notwithstanding the condition of the treasury. The corporation denied an implication in the commissioner's brief that the beneficiary members must look to the pooled fund for indemnity against medical bills and the corporation emphasized that the beneficiary members merely pay for such services on a periodic basis rather than in a lump sum. As the operations of California Physicians' Service, said the court, are comparatively new there is little authority on the direct question as to whether or not these operations are to be classed as insurance. The decided cases favor the corporation's position. In *Butterworth* v. *Boyd,* 12 Cal. (2d) 140, 82 P. (2d) 434, 126 A. L. R. 838, the facts were these: The San Francisco charter provided, in part, compulsory health service to all municipal employees to be paid for by monthly pay roll deductions on all salaries to maintain a fund to cover medical, surgical and hospital care. Physicians eligible to render service were paid on the unit system similar to that used by the corporation. In an action brought to test the validity of the charter the state insurance commissioner appeared specially to raise the question as to whether the activities in question were a form of insurance and as such subject to the state insurance code. The court there said that the Insurance Code dealt only with the private business of insurance. In *Commissioner of Bank and Insurance* v. *Community Health Service,* 129 N. J. L. 427, 30 A. (2d) 44, the sole question involved was whether or not the corporation was engaged in the insurance business. It was incorporated to provide medical services to its subscribers. It made contracts with licensed physicians to render professional services for a stipulated compensation. The subscribers were entitled to the services whether or not they needed them. The corporation did not, in the words of the California court, undertake to pay such debt as the subscribers might incur and did not indemnify them against any loss. The New Jersey court said:

> Neither as between the corporation and the physician nor as between the physician and the subscriber is the compensation or any other element of the arrangement between them affected by any contingency, hazard or risk.

In holding that the business conducted by the corporation was not one of insurance, the New Jersey court cited with approval *State ex rel. Fishback* v. *Universal Service Agency,* 87 Wash. 413, 151 P. 768, Ann. Cas. 1916C, 1017; *Sisters of Third Order*

1. Specifically this law, so far as is here material, reads as follows:

"A nonprofit corporation may be formed under this article for the purposes of defraying or assuming the cost of professional services of licentiates under any chapter of Division 2 of the Business and Professions Code or of rendering any such services, but it may not engage directly or indirectly in the performance of the corporate purposes or objects unless:

"(1) At least one fourth of all licentiates of the particular profession become members;

"(2) Membership in the corporation and an opportunity to render professional services upon a uniform basis is available to all licensed members of the particular profession;

"(3) Voting by proxy and cumulative voting are prohibited; and

"(4) A certificate has been issued to the corporation by the particular professional board, whose licentiates have become members, finding compliance with the foregoing requirements.

"Any such nonprofit corporation shall be subject to supervision by the particular professional board under which its members are licensed and shall also be subject to the provisions of Section 605c of this code. . . ." [The section 605c mentioned provides for supervision by the attorney general of the conduct of a nonprofit corporation holding property subject to any public or charitable trust.]

of St. Francis v. *Guillaume's Estate*, 222 Ill. App. 543, and *Stern* v. *Rosenthal*, 71 Misc. 422, 128 N. Y. S. 711. In *Jordan* v. *Group Health Ass'n*, 71 App. D. C. 38, 107 F. (2d) 239, a declaratory judgment was sought against the insurance commissioner of the District of Columbia to determine whether the activities of the association were subject to the supervision of the insurance commissioner. The Group Health Association was a nonprofit corporation organized to provide without profit medical services, surgery and hospitalization for its members. Its membership was limited to civil service employees of the executive branch of the federal government. In holding that the Group Health Association was not engaged in the insurance business the Circuit Court of Appeals for the District of Columbia had this to say:

> Although Group Health's activities may be considered in one aspect as creating security against loss from illness or accident, more truly they constitute the quantity purchase of well founded, continuous medical service by its members. Group Health is in fact and in function a consumer cooperative. The functions of such an organization are not identical with those of insurance or indemnity companies. The latter are concerned primarily, if not exclusively, with risk and the consequences of its descent, not with service, or its extension in kind, quantity or distribution; with the unusual occurrence, not the daily routine of living. Hazard is predominant. On the other hand, the cooperative is concerned principally with getting service rendered to its members and doing so at lower prices made possible by quantity purchasing and economies in operation. Its primary purpose is to reduce the cost rather than the risk of medical care; to broaden the service to the individual in kind and quantity; to enlarge the number receiving it; to regularize it as an everyday incident of living, like purchasing food and clothing or oil and gas, rather than merely protecting against the financial loss caused by extraordinary and unusual occurrences, such as death, disaster at sea, fire and tornado. It is, in this instance, to take care of colds, ordinary aches and pains, minor ills and all the temporary bodily discomforts as well as the more serious and unusual illnesses. To summarize, the distinctive features of the cooperative are the rendering of service, its extension, the bringing of physician and patient together, the preventive features, the regularization of service as well as payment, the substantial reduction in cost by quantity purchasing, in short, getting the medical job done and paid for; not, except incidentally to these features, the indemnification for cost after the service is rendered. Except the last, these are not distinctive or generally characteristic of the insurance arrangement. There is, therefore, a substantial difference between contracting in this way for the rendering of service, even on the contingency that it be needed, and contracting merely to stand its cost when or after it is rendered. . . . But obviously it was not the purpose of the insurance statutes to regulate all arrangements for assumption or distribution of risk. That view would cause them to engulf practically all contracts, particularly conditional sales and contingent service agreements. The fallacy is in looking only at the risk element to the exclusion of all others present or their subordination to it. The question turns, not on whether risk is involved or assumed, but on whether that or something else to which it is related in the particular plan is its principal object and purpose.

We find in that case the express admission 71 App. D. C. at page 47 (107 F. (2d) at page 248) "that the identical plan and service rendered here would not be 'insurance' or 'indemnity' if offered by an organization owned, operated and controlled by physicians. It would then be a contract 'for service on contingency,' though the same element of risk and avoidance of its possible consequences would be present." Other authorities giving support to these views, in the court's opinion, were *State* v. *Universal Service Agency*, 87 Wash. 413, 151 P. 768, Ann. Cas. 1916C, 1017, supra; and *Commissioner of Bank and Insurance* v. *Community Health Service*, 129 N. J. L. 427, 30 A. (2d) 44.

There is no essential difference, concluded the court, between the Group Health Association, the San Francisco Health Service and California Physicians' Service except that in the first two the administrative management is in a board selected by the beneficiary members, whereas in the latter it is in a board selected by the professional members. All are nonprofit, semicharitable organizations conducted for the primary purpose of affording necessary medical care to those of small income. None are organized to insure good health or freedom from disease. We are satisfied that on the authorities cited it must be held that California Physicians' Service is not engaged in the insurance business and is not subject to the supervision of the commissioner under the Insurance Code.

The declaratory judgment in favor of California Physicians' Service was, in effect, affirmed.—*California Physicians' Service* v. *Garrison*, *155 P. (2d) 885 (Calif., 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, May 12, page 153.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARIZONA: * Phoenix, July 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: * *Eclectic.* Little Rock, June 7. Sec., Dr. C. H. Young, 1415 Main St., Little Rock. *Medical.* Little Rock, June 7-8. Sec., Dr. D. L. Owens, 701 Main St., Little Rock.

CALIFORNIA: *Oral.* San Francisco, May 20. *Written.* San Francisco, July 9-12. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO: * Denver, July 3-7. Final date for filing application is June 18. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * *Homeopathic.* New Haven, July 10-11. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven. *Medical. Examination.* New Haven, July 10-11. *Endorsement.* New Haven, July 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE: *Examination.* Dover, July 10-12. *Reciprocity.* Dover, July 17. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * *Reciprocity.* Washington, June 11. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington 1.

FLORIDA: * Jacksonville, June 25-26. Sec., Dr. Harold D. Van Schaick, 2736 S. W. Seventh Ave., Miami 36.

IDAHO: Boise, July 10. Dir., Bureau of Occupational Licenses, Miss Agnes Barnhart, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, June 26-28. Superintendent of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

KANSAS: Kansas City, June 28-29. Sec., Board of Medical Registration & Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City 10.

KENTUCKY: Louisville, June 18-20. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville 2.

LOUISIANA: June. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans 12.

MARYLAND: *Medical.* Baltimore, June 19-22. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 19-20. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 10-13. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F. State House, Boston.

MICHIGAN: * Detroit, June 26-28. Sec., Board of Registration in Medicine, Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

MINNESOTA: * Minneapolis, June 19-21. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: Jackson, June 25-26. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MISSOURI: St. Louis, June 7-9. Sec., State Board of Health, Miss Erma E. Nixon, State Capitol Bldg., Jefferson City.

MONTANA: Helena, Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEW JERSEY: Trenton, June 19-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NORTH DAKOTA: Grand Forks, July 3. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, July. *Examination.* Columbus, June 18-21. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, June 14-16. Sec., Dr. J. D. Osborn, Jr., Frederick.

SOUTH CAROLINA: Columbia, June 25-27. Sec., Dr. N. B. Heyward, 1329 Blandina St., Columbia.

SOUTH DAKOTA: * Pierre, July 17-18. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, State Capitol, Pierre.

TEXAS: Galveston, June 4-6. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

VERMONT: Burlington, June. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: * Richmond, June 20-23. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON: * Seattle, July 16-18. Sec., Department of Licenses, Miss Nell Adams, Olympia.

WEST VIRGINIA: Charleston, July 5-7. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN: * Milwaukee, June 26-28. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, June 4-5. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, June 6-7. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: June 9. Address State Board of Healing Arts, 250 Church St., New Haven 10.

FLORIDA: DeLand, June 1. Final date for filing application is May 17. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

MINNESOTA: Minneapolis, June 5-6. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

OREGON: Portland, July 7. Sec., Mr. C. D. Byrne, University of Oregon, Eugene.

SOUTH DAKOTA: Yankton, June 19. Sec., Dr. G. M. Evans, Yankton.

Council on Medical Education and Hospitals

HOSPITAL MEDICAL LIBRARY SUGGESTIONS

Prepared by the Council on Medical Education and Hospitals of the American Medical Association

An adequate library is essential in hospitals that undertake an educational function. To interns and resident physicians it is especially important as a source of immediate reference in the study of diagnostic and therapeutic problems and in the preparation of reports for staff meetings and clinical conferences. Indeed, to all physicians a medical library plays a significant part in the continuation of their education.

"A medical group which works with little or no reference to books and journals suffers serious limitations. Without knowledge of what others have discovered, daily experience cannot be resourcefully interpreted. Avoidable mistakes, waste and duplication of effort are inevitable. Doctors become victims of empiricism and routine; imagination and initiative lack stimulus; enthusiasm and energy decline; minds grow sterile that under the quickening influence of the recorded experience of others might have been fruitful." [1]

The following are the minimum needs of a reference library as expressed in the Essentials of an Approved Internship:

"There should be a medical library, in charge of a competent librarian, located where it is readily accessible to the interns and staff and containing a useful collection of recent editions of standard text and reference books and current files of not less than ten of the representative medical journals. Interns should be encouraged to use the library in connection with their clinical work and may properly be asked to report on current medical opinion concerning any special case at the bedside or to review current literature on any selected topic more formally at staff conferences or at journal club meetings that may be organized for the purpose of stimulating an interest in reading."

Similarly in the Essentials of Approved Residencies and Fellowships it is stated that "institutions offering graduate training should maintain or provide ready access to an adequate medical library containing modern texts, the *Quarterly Cumulative Index Medicus* and current journals relating to the fields in which residencies and fellowships are offered."

These standards serve as a guide to the establishment of a working library for the house staff where material will be available for general reference. For special needs it is usually possible to obtain additional material from outside sources.

ORGANIZATION

The usefulness of a medical library depends largely on its accessibility, the scope and quality of reference material, and the ability of the librarian and the staff to stimulate an interest in the review of medical literature. It is especially important that the medical staff should take an active interest in the development and maintenance of a suitable library, its financial support, technical supervision, the selection of books and periodicals, and the establishment of appropriate rules and regulations.

A committee of the staff should be appointed to maintain general supervision. Technical direction, however, can be assigned to a librarian who has had adequate training and experience in this work. In the absence of an experienced librarian a competent person from the record department or administrative personnel could be placed in charge.

The medical library is of sufficient importance in the educational scheme to justify the annual budgeting of funds for this purpose. Ordinarily it would require from $300 to $500 to establish a satisfactory nucleus of reference material for the house staff. By the gradual addition of books and periodicals from year to year a library would be evolved that could be considered an asset to the institution and the community. The annual expenditure would vary in accordance with the amount of reference material supplied, but usually it would require a minimum of $150 to $300 to provide the necessary books and journals.

When funds are not furnished through gifts, endowments or the operating budget, it may be possible to maintain the library by annual contributions from the attending physicians. These funds might then be collected in the form of staff dues.

LOCATION

It would be worth while for those interested in developing a medical library to visit similar departments and study the elements that contribute to their success. Any well organized library, general or medical, would furnish valuable suggestions concerning space and equipment, classification of subjects, indexing, and methods of filing, binding and storage.

The location of the medical library will in a large measure determine its usefulness. If it is readily accessible, comfortable and attractive, it will soon become the center of interest of the house staff. The library is most frequently found in the administrative section of the hospital near the record department or staff room, but other locations will also prove satisfactory if adequate organization and supervision are maintained. The room should be sufficiently large to house books, periodicals, reprints and other material without encroaching on the space needed for comfortable reading and uninterrupted study.

REFERENCE MATERIAL

In establishing a medical library, it is well to purchase only a few reference books on each subject. Only recent volumes should be chosen, with the exception of such standard works as are recognized classics in their respective fields and do not rapidly become obsolete. The literature on therapy and diagnosis, for example, is changing with such rapidity that the use of the most recent publications is recommended. In the field of fundamental sciences, such as anatomy and histology, literature is more stabilized and longer lived. More recent editions of the standard textbooks should be added from time to time, thus keeping the library up to date with regard to new methods of diagnosis and treatment. After a good foundation has been formed, the remainder of the apportioned funds may be expended in purchasing varied reference works that are known to be of particular value. The library should not be allowed to become a depository for antiques, and out of date books should be removed or discarded.

1. Dr. George E. Vincent, speaking on the occasion of the celebration of the fiftieth anniversary of the Boston Medical Library, Jan. 19, 1926.

The usefulness and efficiency of the hospital medical library depend not only on a good selection of medical books but also on a well chosen group of periodicals. Limited library funds are often more usefully expended for periodicals than for text and reference books. When ample funds are provided there is no great difficulty experienced in the selection of material.

The hospital library may supplement its service by the use of the library facilities of nearby medical schools, the academy of medicine or the local county medical society. It may also utilize the package library of the American Medical Association. This consists of collections of reprints and other material on various subjects, prepared for lending to members of the Association and to individual subscribers to publications of the American Medical Association. Information on the loan systems of medical school libraries or society libraries can readily be obtained on inquiry.

SUGGESTED PERIODICALS

The following list is furnished as a guide to the selection of medical periodicals in accordance with the needs of individual hospitals. In view of the interrelation of the various fields of medicine it is desirable that a wide selection be made to cover both general and special subjects. To accomplish this a minimum of ten periodicals would ordinarily be required. No attempt has been made to include all of the useful journals in the various fields; only a few have been selected which it is believed the average general hospital would find particularly desirable. For a complete list of periodicals, both domestic and foreign, reference should be made to the *Quarterly Cumulative Index Medicus.*

ANESTHESIOLOGY

Anesthesiology. Business Manager, Dr. William G. Schmidt, 235 N. 15th St., Philadelphia. Bi-M. $6.
Current Researches in Anesthesia and Analgesia. 318 Hotel Westlake, Rocky River 16, Ohio. Bi-M. $10.

DERMATOLOGY AND SYPHILOLOGY

American Journal of Syphilis, Gonorrhea and Venereal Diseases. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3. Bi-M. $7.50.
Archives of Dermatology and Syphilology. American Medical Association, 535 N. Dearborn St., Chicago 10. M. $8.

HOSPITAL ADMINISTRATION

Hospitals, The Journal of the American Hospital Association. 18 E. Division St., Chicago 10. M. $2. Nonmembers, $3.
Hospital Management. 100 E. Ohio St., Chicago 11. M. $2.
Hospital Progress. 1402 S. Grand Blvd., St. Louis 4. M. $3.
Modern Hospital. 919 N. Michigan Ave., Chicago 11. M. $3.

INDEX AND DIRECTORY

American Medical Directory. American Medical Association, 535 N. Dearborn St., Chicago 10. Bi-A. $18. (A register of legally qualified physicians of the United States, Alaska, Canal Zone, Hawaii, Philippines, Puerto Rico, Guam, Samoa and Virgin Islands, Canada, Newfoundland, Yukon and Northwest Territories. Contains a list of hospitals in the same countries.)
Quarterly Cumulative Index Medicus. American Medical Association, 535 N. Dearborn St., Chicago 10. Q. $12. (An index and guide to the medical literature of the world.)

INDUSTRIAL HEALTH

Industrial Medicine. 605 N. Michigan Ave., Chicago. M. $5.
Journal of Industrial Hygiene and Toxicology with Abstract of Literature. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2. M. $6.

MEDICINE

American Heart Journal. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3. M. $10.
American Journal of the Medical Sciences. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6. M. $6.
Annals of Allergy. American College of Allergists, 401 LaSalle Medical Bldg., Minneapolis 2. Bi-M. $6.
Annals of Internal Medicine. American College of Physicians, Prince and Lemon Sts., Lancaster, Pa. M. $7.
Archives of Internal Medicine. Amercian Medical Association, 535 N. Dearborn St., Chicago 10. M. $5.
Canadian Medical Association Journal. 3640 University St., Montreal. M. $7.35.
Clinics. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5. Bi-M. Cloth, $16; paper, $12.
Endocrinology. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill. M. $10.50.
Gastroenterology. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2. M. $6.
Journal of Allergy. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3. Bi-M. $7.50.
Journal of Clinical Endocrinology. Charles C Thomas, Publisher, 220 E. Monroe St., Springfield, Ill. M. $6.50.
Journal of the American Medical Association. 535 N. Dearborn St., Chicago 10. W. $8.
Journal of Clinical Investigation. Dr. Charles A. Janeway, Treasurer, Children's Hospital, 300 Longwood Ave., Boston. Bi-M. $10.
Journal of Nutrition. Wistar Institute of Anatomy and Biology, 36th St. and Woodland Ave., Philadelphia 4. M. $10.
Medical Clinics of North America. W. B. Saunders Company, W. Washington Sq., Philadelphia 5. Bi-M. Cloth, $16; paper, $12.
Medicine, Analytical Reviews of General Medicine, Neurology and Pediatrics. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2. Q. $5.
New England Journal of Medicine. 8 The Fenway, Boston 15. W. $6.

MILITARY MEDICINE

Bulletin of the United States Army Medical Department. Book Shop, Medical Field Service School, Carlisle Barracks, Pa. M. $2.
Journal of Aviation Medicine. Bruce Publishing Company, 2642 University Ave., St. Paul. Bi-M. $5.
United States Naval Medical Bulletin. Superintendent of Documents, Government Printing Office, Washington, D. C. Bi-M. $2.
War Medicine. American Medical Association, 535 N. Dearborn St., Chicago 10. M. $6.

NEUROLOGY AND PSYCHIATRY

American Journal of Psychiatry. American Psychiatric Association, 9 Rockefeller Plaza, New York 20. Bi-M. $6.
Archives of Neurology and Psychiatry. American Medical Association, 535 N. Dearborn St., Chicago 10. M. $8.
Journal of Nervous and Mental Disease. 64 W. 56th St., New York 19. M. $10.

OBSTETRICS AND GYNECOLOGY

American Journal of Obstetrics and Gynecology. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3. M. $10.
Surgery, Gynecology and Obstetrics. (Listed under Surgery.)

OPHTHALMOLOGY

American Journal of Ophthalmology. Ophthalmic Publishing Company, 837 Carew Tower, Cincinnati. M. $10.
Archives of Ophthalmology. American Medical Association, 535 N. Dearborn St., Chicago 10. M. $8.

ORTHOPEDIC SURGERY

Journal of Bone and Joint Surgery. 8 The Fenway, Boston 15. Q. $5.

OTORHINOLARYNGOLOGY

Annals of Otology, Rhinology and Laryngology. Annals Publishing Company, 7200 Wydown Blvd., St. Louis 5. Q. $6.
Archives of Otolaryngology. American Medical Association, 535 N. Dearborn St., Chicago 10. M. $6.

PATHOLOGY AND CLINICAL LABORATORY WORK

American Journal of Clinical Pathology. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2. M. $6.
American Journal of Pathology. Dr. C. V. Weller, E. University Ave., Ann Arbor, Mich. Bi-M. $8.
Archives of Pathology. American Medical Association, 535 N. Dearborn St., Chicago 10. M. $6.
Journal of Laboratory and Clinical Medicine. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3. M. $8.50.

PEDIATRICS

American Journal of Diseases of Children. American Medical Association, 535 N. Dearborn St., Chicago 10. M. $8.
Journal of Pediatrics. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3. M. $8.50.

PHYSICAL MEDICINE

Archives of Physical Medicine. American Congress of Physical Medicine, 30 N. Michigan Ave., Chicago 2. M. $5.

PHYSIOLOGY AND BIOCHEMISTRY

American Journal of Physiology. American Physiological Society, Managing Editor, Dr. D. R. Hooker, 19 W. Chase St., Baltimore 1. M. $30.
Journal of Biological Chemistry. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2. M. $22.50.
Physiological Reviews. American Physiological Society. Dr. D. R. Hooker, Managing Editor, 19 W. Chase St., Baltimore 1. Q. $6.

PUBLIC HEALTH

American Journal of Hygiene. 615 N. Wolfe St., Baltimore. Bi-M. $12.
American Journal of Public Health and the Nation's Health. 1790 Broadway, New York 19. M. $5.
Hygeia. 535 N. Dearborn St., Chicago 10. M. $2.50.

RADIOLOGY

American Journal of Roentgenology and Radium Therapy. Charles C Thomas, 301-327 E. Lawrence Ave., Springfield, Ill. M. $10.
Radiology. Radiological Society of North America, 607 Medical Arts Bldg., Syracuse 2, N. Y. M. $6.

SURGERY

American Journal of Surgery. 49 W. 45th St., New York 19. M. $10.
Annals of Surgery. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5. M. $10.
Archives of Surgery. American Medical Association, 535 N. Dearborn St., Chicago 10. M. $8.
Journal of Neurosurgery. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill. Bi-M. $7.50.
Journal of Thoracic Surgery. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3. Bi-M. $7.50.
Surgery. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3. M. $10.
Surgery, Gynecology and Obstetrics with Internal Abstract of Surgery. Surgical Publishing Company, 54 E. Erie St., Chicago 11. M. $12.
Surgical Clinics of North America. W. B. Saunders Company, W. Washington Sq., Philadelphia 5. Bi-M. Cloth, $16; paper, $12.

TUBERCULOSIS

American Review of Tuberculosis. National Tuberculosis Association, 1790 Broadway, New York 19. M. $8.

UROLOGY

Journal of Urology. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimroe 2. M. $10.

SUGGESTED BOOKS

The books mentioned in the following list are suggested as a guide for hospital medical libraries. The list is not in any sense complete but should serve to indicate the type of books ordinarily required in the organization of educational services for interns and resident physicians. The *Quarterly Cumulative Index Medicus,* medical publishers' lists, the Book Notices section of THE JOURNAL and other sources of information can also be utilized in the selection of suitable hospital reference material. Modern medical practice is constantly changing and it is therefore recommended that hospital medical libraries adopt a policy of constantly replacing older medical textbooks with those which are new and up to date. In accordance with this principle the books included in this list, with few exceptions, have appeared for the first time or in revised editions since 1940. The names and addresses of the publishers appear at the end of the list of books.

ANATOMY

Bailey, F. R.: Text-Book of Histology. Ed. 11, ed. by Philip E. Smith. $6. Wood, 1944.
Beesly, L., and Johnston, T. B.: Manual of Surgical Anatomy. Ed. 5, rev. by J. Bruce and R. Walmsley. $6.50. Oxford, 1939.
Callander, C. Latimer: Surgical Anatomy. Ed. 2. $10. Saunders, 1939.
Cowdry, E. V.: Textbook of Histology. Ed. 3. $7. Lea, 1944.
Cunningham, Daniel J.: Text-Book of Anatomy. Ed. 8, ed. by J. C. Brash and E. B. Jamieson. $12. Oxford, 1943.
Grant, J. C. B.: Atlas of Anatomy. $10. Williams and Wilkins, 1944.
Gray, Henry: Anatomy of the Human Body. Ed. 24, rev. and ed. by Warren H. Lewis and others. $12. Lea, 1942.
Jordan, H. E., and Kindred, J. E.: Textbook of Embryology. Ed. 4. $6.75. Appleton, 1942.
Krieg, Wendell J. S.: Functional Neuroanatomy. $6.50. Blakiston, 1942.
Maksimov, A. A., and Bloom, W.: Textbook of Histology. Ed. 4. $7. Saunders, 1942.
Ranson, Stephen W.: Anatomy of the Nervous System. Ed. 7. $6.50. Saunders, 1943.
Rasmussen, Andrew T.: Principal Nervous Pathways. Ed. 2. $2.50. Macmillan, 1941.
Stohr, P., and Lewis, F. T.: Text-Book of Histology. Arr. on an embryological basis by J. L. Bremer; rewritten by H. L. Weatherford. Ed. 6. $7. Blakiston, 1944.
Strong, Oliver S., and Elwyn, Adolph: Human Neuroanatomy. $6. Williams and Wilkins, 1943.

ANESTHESIOLOGY

Adriani, John: Pharmacology of Anesthetic Drugs. Ed. 2. $3.50. Thomas, 1941.
Andrews, Albert H.: Manual of Oxygen Therapy Techniques. $1.75. Year Bk. Pubs., 1943.
Gillespie, N. A.: Endotracheal Anaesthesia. $4. Univ. of Wis. Press, 1941.
Lundy, J. S.: Clinical Anesthesia. $9. Saunders, 1942.
Subcommittee on Anesthesia of Division of Medical Science, National Research Council: Fundamentals of Anesthesia. Ed. 2. $2.50. A. M. A., 1944.

CARDIOLOGY

American Heart Association: Nomenclature and Criteria for Diagnosis of Diseases of the Heart. Ed. 4. $2. Am. Heart Assoc., 1939.
Herrick, James B.: Short History of Cardiology. $3.50. Thomas, 1942.
Herrmann, George R.: Synopsis of Diseases of the Heart and Arteries. Ed. 3. $5. Mosby, 1944.
Levine, Samuel A.: Clinical Heart Disease. Ed. 3. $6. Saunders, 1945.
Lewis, Sir Thomas: Diseases of the Heart. Ed. 3. 15s. Macmillan, 1942.
Pardee, Harold E. B.: Clinical Aspects of the Electrocardiogram. Ed. 4. $5.75. Hoeber, 1941.
White, Paul D.: Heart Disease. Ed. 3. $9. Macmillan, 1944.

DERMATOLOGY AND SYPHILOLOGY

Becker, S. W., and Obermayer, M. E.: Modern Dermatology and Syphilology. $12. Lippincott, 1940.
Moore, Joseph E., and others: Modern Treatment of Syphilis. Ed. 2, enlarged third printing. $7.50. Thomas, 1944.
Ormsby, Oliver S., and Montgomery, Hamilton: Diseases of the Skin. Ed. 6. $14. Lea, 1943.
Pardo-Castelló, V.: Diseases of the Nails. Ed. 2. $3.50. Thomas, 1941.
Stokes, John H., and others: Modern Clinical Syphilology. Ed. 3. $10. Saunders, 1944.
Sulzberger, M. B.: Dermatologic Allergy. $8.50. Thomas, 1940.

DIAGNOSIS

Barton, Wilfred M., and Yater, W. M.: Symptom Diagnosis, Regional and General. Ed. 4. $10. Appleton, 1942.
Cabot, Richard C., and Adams, F. D.: Physical Diagnosis. Ed. 13, ed. by F. D. Adams. $5. Wood, 1942.
Cope, Zachary: Early Diagnosis of the Acute Abdomen. Ed. 8. $3.75. Oxford, 1940.
Elmer, Warren P., and Rose, W. D.: Physical Diagnosis. Ed. 8, rev. by Harry Walker. $8.75. Mosby, 1940.
Major, R. H.: Physical Diagnosis. Ed. 2. $5. Saunders, 1940.
Norris, George W., and Landis, H. R. M.: Diseases of the Chest and the Principles of Physical Diagnosis. Ed. 6. $10. Saunders, 1938.

DIETETICS AND NUTRITION

American Medical Association. Council on Foods and Nutrition: Handbook of Nutrition. $2.50. A. M. A., 1943.
Bogert, L. Jean: Nutrition and Physical Fitness. Ed. 4. $3. Saunders, 1943.
Bridges, Milton A.: Dietetics for the Clinician. Ed. 4. $10. Lea, 1941.
Eddy, Walter H., and Dalldorf, Gilbert: The Avitaminoses: The Chemical, Clinical and Pathological Aspects of the Vitamin Deficiency Diseases. Ed. 3. $4.50. Williams and Wilkins, 1944.
Hawley, Estelle E., and Carden, Grace: Art and Science of Nutrition. Ed. 2. $3.75. Mosby, 1944.
McCollum, E. V., and Becker, J. E.: Food, Nutrition and Health. Ed. 5. $1.50. E. V. McCollum, East End Station, Baltimore, 1940.
McLester, James S.: Nutrition and Diet in Health and Disease. Ed. 4. $8. Saunders, 1943.
Pelner, Louis: Diet Therapy of Disease. $3.75. Personal Diet Service, 145 W. 45th St., New York, 1944.
Rose, Mary S.: Foundations of Nutrition. Ed. 4, rev. by Grace MacLeod and Clara M. Taylor. $3.75. Macmillan, 1944.
Sherman, Henry C.: Chemistry of Food and Nutrition. Ed. 6. $3.25. Macmillan, 1941.
Sherman, Henry C., and Lanford, C. S.: An Introduction to Foods and Nutrition. $2. Macmillan, 1943.
Stern, Frances: Applied Dietetics. Ed. 2. $4. Williams and Wilkins, 1943.

ENDOCRINOLOGY

Allen, Edgar; Danforth, C. H., and Doisy, Edward A. (eds.): Sex and Internal Secretions. Ed. 2. $12. Wood, 1939.
Glandular Physiology and Therapy. A symposium prepared under the auspices of the Council on Pharmacy and Chemistry of the A. M. A. Ed. 2. $2.50. A. M. A., 1942.
Grollman, Arthur: Essentials of Endocrinology. $6. Lippincott, 1941.
Sevringhaus, E. L.: Endocrine Therapy in General Practice. Ed. 4. $2.75. Year Bk. Pubs., 1942.
Van Dyke, H. B.: Physiology and Pharmacology of the Pituitary Body. In 2 volumes. $4.50 per volume. Univ. of Chicago Press, 1939.
Werner, August A.: Endocrinology, Clinical Application and Treatment. Ed. 2. $10. Lea, 1942.

FRACTURES AND DISLOCATIONS

(See Orthopedic Surgery)

HISTORY OF MEDICINE

Clendening, Logan: Behind the Doctor. Ed. 2. $4. Knopf, 1943.
Cushing, Harvey W.: Life of Sir William Osler. In 2 volumes. $10. Oxford, 1940.
Fishbein, Morris: Frontiers of Medicine. $1. Williams and Wilkins, 1933.
Garrison, Fielding H.: Introduction to the History of Medicine. Ed. 4. $12. Saunders, 1929.

HOSPITAL ORGANIZATION AND MANAGEMENT

American Medical Association: Interns Manual. 60 cents. A. M. A., 1943.
American Medical Association: Standard Nomenclature of Disease and Standard Nomenclature of Operations. Ed. 3. $4. A. M. A., 1942.
Bachmeyer, A. C., and Gerhard, G. G. F. (eds.): The Hospital in Modern Society. $5. Commonwealth Fund, 1943.
Huffman, Edna K.: Manual for Medical Records Librarians. $3. Physicians Record Company, 1941.
MacEachern, Malcolm T.: Hospital Organization and Management. $7.50. Physicians Record Company, 1940.
MacEachern, Malcolm T.: Medical Records in the Hospital. $3. Physicians Record Company, 1937.
Mills, Alden B.: Hospital Public Relations. $3.75. Physicians Record Company, 1939.
Morrill, Warren P.: Hospital Manual of Operations. $3. Lakeside Publishing Company, 1934.
Ponton, Thomas R.: Medical Staff in the Hospital. $2.50. Physicians Record Company, 1939.

INFECTIOUS DISEASES, HYGIENE AND PREVENTIVE MEDICINE

Boyd, Mark F.: Preventive Medicine. Ed. 6. $5. Saunders, 1940.
Dunham, George C.: Military Preventive Medicine. Ed. 3. Military Service, 1940.
Gage, Nina D., and others: Communicable Diseases. Ed. 4. $3.50. Davis, 1944.
Harries, E. H. R., and Mitman, M.: Clinical Practice in Infectious Diseases. Ed. 2. $6. Williams and Wilkins, 1944.
National Research Council, Division of Medical Science: Manual of Tropical Medicine. $6. Saunders, 1945.
Smillie, Wilson G.: Public Health Administration in the United States. Ed. 2. $3.75. Macmillan, 1940.
Stimson, Philip M.: A Manual of the Common Contagious Diseases. Ed. 3. $4. Lea, 1940.
Stitt, E. R.: Diagnosis, Prevention and Treatment of Tropical Diseases. Ed. 7. In 2 volumes. $21. Blakiston, 1944.

MEDICAL DICTIONARIES

Dorland, William A. N., and Miller, E. C. LeR.: American Illustrated Medical Dictionary. Ed. 20. $7. With thumb index, $7.50. Saunders, 1944.
Gould, George M.: Medical Dictionary. Ed. 5. $7. With thumb index, $7.50. Blakiston, 1941.
Lang, Hugo: German-English Dictionary of Terms Used in Medicine and the Allied Sciences. Ed. 4. $10. Blakiston, 1932.
Stedman, Thomas L.: Practical Medical Dictionary. Ed. 15. $7. With thumb index, $7.50. Wood, 1942.

MEDICAL JURISPRUDENCE, LEGAL MEDICINE AND TOXICOLOGY

American Medical Association, Bureau of Legal Medicine and Legislation: Medicolegal Cases: Abstracts of Court Decisions, 1926 to 1930 Inclusive. $7. A. M. A., 1932. Medicolegal Cases: Abstracts of Court Decisions, 1931 to 1935 Inclusive. $5.50. A. M. A., 1936. Medicolegal Cases: Abstracts of Court Decisions, 1936 to 1940 Inclusive. $5.50. A. M. A., 1942.

Brahdy, Leopold, and Kahn, Samuel (eds.): Trauma and Disease. Ed. 2. $7.50. Lea, 1941.

Glaister, John: Medical Jurisprudence and Toxicology. Ed. 7. $8. Wood, 1942.

Gonzales, Thomas A.; Vance, Morgan, and Helpern, Milton: Legal Medicine and Toxicology. $10. Appleton, 1940.

Hayt, Emanuel, and Hayt, L. R.: Legal Guide for American Hospitals. $5. Hospital Textbook Company, 1940.

Kessler, Henry H.: Accidental Injuries: The Medico-Legal Aspects of Workmen's Compensation and Public Liability. Ed. 2. $10. Lea, 1941.

McBride, Earl D.: Disability Evaluation. Ed. 3. $9. Lippincott, 1942.

Smith, Sydney A.: Forensic Medicine: A Text-Book for Students and Practitioners. Ed. 8. 28s. Churchill, 1943.

MEDICINE

Beckman, Harry: Treatment in General Practice. Ed. 4. $10. Saunders, 1942.

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Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

14:181-208 (Feb.) 1945

Bronchiectasis. J. O. Lisenby.—p. 181.
Planning for Medical Care in Postwar Period, with Particular Reference to Alabama. J. Newdorp.—p. 183.
Value of Preemployment Examination in Industrial Health Program. P. W. Auston.—p. 189.
Management of Complications of Intraocular Surgery. H. W. Frank. —p. 193.

14:209-232 (March) 1945

Total versus Subtotal Hysterectomy. J. O. Morgan.—p. 209.
Planning for Medical Care in Postwar Period, with Particular Reference to Alabama: Part II. J. Newdorp.—p. 213.
What Surgeon Should Know of Radiology in Treating Malignancy. I. P. Levi.—p. 219.

Amer. Journal of Digestive Diseases, Fort Wayne, Ind.

12:61-96 (March) 1945

Orientation of Gastroscope by Roentgenograms. A. R. Hufford and G. G. Stonehouse.—p. 61.
Aluminum Phosphate Gel in Treatment of Peptic Ulcer. J. Lichstein, S. Simkins and M. Bernstein.—p. 65.
Bacillary Dysentery in Curaçao, Netherlands West Idies. A. W. Pot. —p. 70.
Gastrointestinal Disorders Simulating Circulatory Disease and Vice Versa. F. M. Groedel.—p. 73.
Nutritional Significance of Amino Acids and Proteins. M. Sahyun. —p. 80.
Arterial Thrombosis Associated with Chronic Ulcerative Colitis. Mary E. Martin.—p. 85.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

53:109-212 (Feb.) 1945

Roentgenologic Appearance and Pathology of Intrapulmonary Lymphatic Spread of Metastatic Cancer. H. P. Mueller and R. C. Sniffen. —p. 109.
Pulmonary Changes in Cardiospasm. L. E. Hawes and A. B. Soule Jr. —p. 124.
Congenital Aplasia of Lung. R. L. Garber.—p. 129.
Acute Obstruction of Colon: Differential Diagnosis Between Volvulus and Cancer of Sigmoid Colon by Preliminary Roentgenogram. J. Levitin and H. B. Weyrauch.—p. 132.
Meckel's Diverticulum. M. E. Mottram and L. H. Garland.—p. 142.
*Periosteal Lesions in Scurvy. W. A. Evans Jr.—p. 147.
Roentgenographic Demonstration by Tantalum Powder of Sinuses Resulting from Extraction of Intervertebral Disk Protrusions. C. J. Graf and W. B. Hamby.—p. 157.
Anomalous Development of First Rib Simulating Isolated Fracture. E. R. Bowie and H. G. Jacobson.—p. 161.
Triticeous Cartilages: Roentgen-Anatomic Study. J. W. Grossman. —p. 166.
Changes After Treatment of Unprotected Brain with Large Doses of Roentgen Radiation. O. Marburg, R. Rezek and R. M. Fleming. —p. 171.

Periosteal Lesions in Scurvy.—Evans reviewed roentgenograms of cases in which the diagnosis of scurvy had been made at the Children's Hospital of Michigan during the years 1936 to 1941. During this six year period in a hospital service comprising 106,800 new outpatient visits and 41,773 hospital admissions 93 cases were encountered, indicating that even in these days of vitamin consciousness infantile scurvy is not rare. It occurs almost exclusively in the narrow age range of 7 to 15 months. The most advanced lesions were usually seen in the knees, followed by the shoulder and ankle joints, and then by the wrist, hips and elbow joints. The earliest changes represented by the ground glass type of demineralization of the bone structure and by the signet ring appearance of the epiphyses are seen with great frequency but are not of sufficient specificity to be regarded as pathognomonic of scurvy. The signet ring appearance was most pronounced in the epiphyses at the knee joints and was present in the same degree in all of the cases. The ground glass appearance was seen less constantly (74 per cent) and was absent particularly in cases complicated by rickets. The submetaphysial notch, emphasized by Park and his colleagues as the earliest pathognomonic sign of scurvy in the x-ray examination, was observed in 89 per cent of the 93 cases. Periosteal shadows in scurvy were observed to be of two types. The first appears as a narrow triangular shadow having its base at the metaphysis and extending from there for some distance along the shaft. The second type of periosteal shadow is much larger, is usually club shaped and extends along the greater length of the shaft. The periosteal lesions of scurvy depend for their occurrence, location and severity on the severity of the lesions which develop in the metaphysial areas of the long bones.

Annals of Allergy, Minneapolis

3:1-90 (Jan.-Feb.) 1945

Growth and Development of Allergy: Ten Year Study of 100 Allergic Children from Birth to 10 Years of Age. N. W. Clein.—p. 1.
Problems in Diagnosis of Bronchial Asthma. G. L. Waldbott.—p. 12.
Unusual Complications of Bronchial Asthma: Air in Extrapulmonary Spaces. V. J. Derbes, H. T. Engelhardt and W. A. Sodeman.—p. 21.
Pollinosis in San Diego County, Calif., with Proposed Method for Estimation of Relative Importance of Plants Concerned. G. F. Harsh, with technical assistance of Mrs. Helen McMichael and Mrs. Julia Klein.—p. 27.
Soap, Soap Sensitivity and Soap Substitutes. E. A. Brown.—p. 50.
Report of Case of Spontaneous Animal Allergy. G. R. Moreno and Leon Bentolila.—p. 61.
Serum Potassium Response to Epinephrine in Normal and Asthmatic Subjects. S. C. Dees.—p. 64.
Routine Technic of Administration of Antigenic Substances to Hypersensitive Patients: Suggestion for Modification. K. J. Deissler.—p. 71.

Annals of Surgery, Philadelphia

121:129-256 (Feb.) 1945

Craniocerebral War Wounds: Observations on Delayed Treatment. H. G. Schwartz and G. E. Roulhac.—p. 129.
Secondary Suture of War Wounds: Clinical Study of 305 Secondary Closures. H. Wilson.—p. 152.
Refrigeration Anesthesia and Evaluation of Amputation Sites by Arteriogram. E. H. Cayford and H. G. Pretty.—p. 157.
*Biopsy as an Accurate Guide to Decision of Early Skin Grafting. J. E. Pritchard.—p. 164.
Skin Graft of Dorsum of Hand: Use of Large Size Dermatome to Obtain One-Piece Pattern. J. M. Converse.—p. 172.
Proximal Ligation and Thrombectomy for Phlebothrombosis of Femoral and Iliac Veins. F. W. Bancroft.—p. 175.
Economic Value of Peritoneoscopy. M. M. Narancio, J. C. Pierson, G. McNeer and G. T. Pack.—p. 185.
Spontaneous Intra-Abdominal Hemorrhage. M. Marks and S. O. Freedlander.—p. 191.
Comparative Studies of Cancerous versus Noncancerous Breasts. F. W. Foote and F. W. Stewart.—p. 197.
Studies in Surgical Convalescence: II. Preliminary Study of Nitrogen Loss in Exudates in Surgical Conditions. Co Tui, A. M. Wright, J. H. Mulholland, E. S. Breed, I. Barcham and D. Gould.—p. 223.
Effects of Temperature on Digestion of Collagen Sutures and Surgical Gut (Catgut) by Enzymes and by Subcutaneous Tissues of Frog. I. W. Sizer.—p. 231.
Submucosal Morcellation of Hemorrhoids. H. B. Benjamin, H. W. Ahrenberger and C. J. Fairless.—p. 239.
Albright's Syndrome: Report of Case Associated with Multiple Pathologic Fractures, Disseminated Fibrous Dysplasia of Bones, Precocious Puberty and Multiple Pigmented Nevi. A. Behrend.—p. 245.

Biopsy as Guide to Early Skin Grafting.—Pritchard says that in burns it is desirable to have some means of determining whether the wound can be expected to heal spontaneously or whether it should be skin grafted. At the Montreal General Hospital the treatment of burns includes the occlusive compression dressing with an emulsion of sulfathiazole in an oil in water base. This dressing, except in superficial burns which heal within one week, is commonly removed on about the thirteenth or fourteenth day, with the intention of grafting if necessary. It is not easy, even at this stage, to be certain from the gross appearance of the wound whether it is healing satisfactorily or will require grafting. It was decided to submit all questionable cases at the time of removal of the first dressing to biopsy. Rapid frozen sections were relied on. If destruction involves most or all of the hair follicles but spares the sweat glands which lie at a deeper level, spontaneous reepidermization may still be expected, but the process will be slow.

If the destruction extends deep enough to involve the sweat glands there will be no sources of reepidermization other than that at the margins of the wound, and this, in all but small burned areas, is inadequate.

Archives of Neurology and Psychiatry, Chicago

53:91-164 (Feb.) 1945

Blood Supply of Nerves of Upper Limb in Man. S. Sunderland.—p. 91.
Interpretation of Findings in Cerebrospinal Fluid: I. Dementia Paralytica Formula and Necessity of Its Quantitative Differentiation. C. Lange and A. H. Harris.—p. 116.
*Prefrontal Lobotomy in Treatment of Chronic Psychoses, with Special Reference to Section of Orbital Areas Only. L. Hofstatter, E. A. Smolik and A. K. Busch.—p. 125.
Meningioma Obstructing Foramen Magnum. A. E. Bennett and A. Fortes.—p. 131.
Divergence Paralysis and Head Trauma. N. Savitsky and M. J. Madonick.—p. 135.
*Electroencephalographic Evaluation of Primary Behavior Disorders in Children: Correlations with Age, Sex, Family History and Antecedent Illness or Injury. J. S. Gottlieb, J. R. Knott and M. C. Ashby.—p. 138.
Subdural Suppuration Originating in Purulent Leptomeningitis. E. Spitz, Ann Pollak and A. Angrist.—p. 144.
Hyperthermia Following Injury of Preoptic Region: Report of Case. L. E. Beaton and J. D. Herrmann.—p. 150.

Prefrontal Lobotomy in Chronic Psychoses.—Hofstatter and his associates performed prefrontal lobotomy on 45 patients. Thirty of these were studied for twelve months or more after the operation. Of these 8 had been subjected to the unmodified operation and 22 to the section of the orbital area only. None of the patients became worse after the operation. None died. Transitory incontinence occurred in 4 of the 22 patients in whom only the lower quadrants were sectioned and in 4 of the 8 patients in whom all quadrants were transected. Delusional ideas might disappear rapidly or might continue with less emotional impetus than before. During the period of convalescence the patient's psychotic behavior persisted to some extent; then inertia became more prominent. The postoperative rate of recovery of 40 per cent of the total number of patients compares favorably with the computed average of 31.3 per cent of seventeen other American centers. The results of surgical intervention on only the orbital quadrants in these patients appear at least equal to the results obtained with transection of all four quadrants. The orbital areas of the frontal lobes seem to have a role in regulation of the emotions.

Electroencephalographic Evaluation of Behavior Disorders.—Gottlieb and his associates show that there is a high incidence of abnormality in the electroencephalograms of children with primary behavior disorders. In a series of 67 children, none of whom presented signs of organic disease or in whose condition an organic etiologic factor was suspected, 49 per cent had electrical brain potentials which were clearly abnormal. Significantly, greater proportions of abnormal electroencephalograms were found when there was either a history of psychosis, maladjusted personality, chronic alcoholism or epilepsy in the family or a personal history of cerebral trauma or severe illness than when neither of these factors was present.

Archives of Ophthalmology, Chicago

33:97-172 (Feb.) 1945

*Retinal Changes Associated with Diabetes and with Hypertension: Comparison and Contrast. A. J. Ballantyne.—p. 97.
Unusual Type of Keratitis Associated with Exposure to N-Butyl Alcohol (Butanol). D. G. Cogan and W. M. Grant.—p. 106.
Diffuse Neurofibromatosis (von Recklinghausen's Disease) Involving Bulbar Conjunctiva. F. Páez Allende.—p. 110.
Astigmatism at Oblique Axes and Binocular Stereoscopic Spatial Localization. K. N. Ogle and L. F. Madigan.—p. 116.
Cyclopia and Arhinia: New Concept. J. Krafka.—p. 128.
Ocular Defects in 60,000 Selectees. A. H. Downing.—p. 137.
Syndrome of Nonsyphilitic Interstitial Keratitis and Vestibuloauditory Symptoms. D. G. Cogan.—p. 144.
Simple Technic for Corneal Transplantation. M. I. Green.—p. 150.
Industrial Injuries of Eye Caused by Flying Objects. P. W. Tisher.—p. 152.

Retinal Changes in Diabetes and Hypertension.—Ballantyne maintains that the retinopathies of diabetes and of the hypertensive diseases are separate entities. In both conditions the earliest lesions are changes in the retinal vessels. In diabetes these lesions affect primarily the venous, and in hypertension the arterial, side of the retinal circulation. In diabetes these changes point to venous stasis and, in addition to hemorrhages and exudates, consist in congestion of the veins, microaneurysms of the capillaries and gross changes in the principal veins. Microaneurysms seem to be the earliest pathologic change in the fundus of the diabetic patient. Histologically the earliest recognizable change takes the form of minute fatty granules in the vascular endothelium, together with swelling of the endothelial cells. In hypertension fatty granules are observed more frequently in the media and the adventitia. The most striking changes in the retinal veins of diabetic patients appear as expansions, beading and formation of loops, coils and networks, and the predominant microscopic changes at this stage are phlebosclerosis and intraretinal and preretinal networks of large, thin walled vessels. The hemorrhages in diabetic retinopathy occur primarily in the central area of the fundus, are characteristically rounded and occur chiefly in the deep layers, for the most part the internuclear layer. In hypertension arterial changes predominate; the hemorrhages are primarily circumpapillary and striate, owing to their situation in the nerve fiber layer. Exudates are observed in the deep layers but also include patches of gangliform degeneration in the nerve fiber layer.

Archives of Pathology, Chicago

39:67-132 (Feb.) 1945

*Congenital Glycogenic Tumors of Heart. T. M. Batchelor and M. E. Maun.—p. 67.
*Primary Tumor of Heart. R. Straus and R. Merliss.—p. 74.
Esophageal Carcinoma in British West Indian and Panamanian Negroes: Study of Incidence, Etiologic Factors and Pathologic Anatomy in Fifty Cases. W. J. Tomlinson and L. A. Wilson.—p. 79.
Experimental Hypertension: Its Production in Dogs by Intravenous Injection of Streptococci. G. F. Dick.—p. 81.
Ossified Cartilage with Myeloid Fat Marrow in Aortic Ring of Rabbit. W. C. Hueper.—p. 89.
Effects of Abortifacient Paste ("Utra-Jel"): Report of Death from Its Use and of Experimental Study of Its Effects on Rabbits and Rats. R. Straus and N. De Nosaquo.—p. 91.
Adenomyoepithelioma (Cylindroma) of Palatal Mucous Glands. W. H. Bauer and R. A. Fox.—p. 96.
Experimental Nephropathies: 1. Method of Producing Controlled Selective Injury of Renal Units by Means of Chemical Agents. J. P. Simonds and Opal E. Hepler.—p. 103.

Congenital Glycogenic Tumors of Heart.—According to Batchelor and Maun, congenital tumors of the heart are comparatively rare. In the case reported glycogen was demonstrated within the tumor cells of the multiple tumors of the heart of an infant who died on the third day of life. A review of the literature on so-called congenital rhabdomyoma of the heart revealed 62 authentic cases of tumors of the heart that presented a characteristic vacuolated appearance on microscopic examination. The cardiac tumors were seen chiefly in infants and the newborn, with 52 per cent of the patients dying in the first year of life and 86 per cent before they reached puberty. The clinical symptoms were nonspecific, and in no case was the diagnosis made before death. Frequently the symptoms were due to associated lesions. Tuberous sclerosis was found in 50 per cent of the cases. The authors suggest that the term "congenital nodular glycogenic tumors of the heart" should replace "congenital rhabdomyoma" until more is known about the nature of the lesions.

Primary Tumor of Heart.—Strauss and Merliss present 3 additional cases of primary tumor of the heart, 2 of which were instances of myxoma and 1 of myxosarcoma. In 2 the tumor was silent, in the third it produced clinical signs and symptoms of tricuspid stenosis. As a rule, primary tumor of the heart is clinically silent. Only 2 cases are on record which were diagnosed prior to death. In both the tumor was a cancer involving the conduction system and in both there was a hemorrhagic pericardial effusion. In no case of benign tumor has the diagnosis been made before death. Primary tumor of the heart should be considered in the differential diagnosis when there is sudden onset of signs of cardiac decompensation in a young person without a preexisting history of heart disease with no discoverable anatomic basis for the heart disease, a hemorrhagic pericardial effusion, an involvement of valvular function or of the conduction system and signs of valvular stenosis which change on motion of the body as well as signs of mediastinal tumor with alteration of the appearance of the shape of the heart in the roentgenogram.

Arkansas Medical Society Journal, Fort Smith

41:163-182 (Jan.) 1945

Tetanus. W. J. Sheddan.—p. 163.
Modern Concepts of Cardiovascular Disease. C. T. Chamberlain.—p. 165.

41:183-210 (Feb.) 1945

Brief Summary of Modern Concept of Acquired Syphilis. E. J. Easley. —p. 183.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

86:1-122 (March) 1945

Fractures in Battle Casualties. J. T. Coyle and W. D. Thompson Jr. —p. 57.
Toxic Psychoses Following Atabrine. H. S. Gaskill and T. Fitz-Hugh Jr.—p. 63.
Diarrhea Problem in New Guinea Base. A. H. Jacoby, J. R. Loudon, P. S. Wyne and T. R. Failmezger.—p. 70.
Enlisted Man as Psychiatric Aide. N. Hurvitz and R. M. Kramer. —p. 79.
Yaws in a White Soldier. H. Rifkin.—p. 81.
Treatment of Yaws with Penicillin. R. Whitehill and R. Austrian. —p. 84.
Treatment of Acute Gonorrhea with Penicillin: Results in 100 Cases. J. H. Long.—p. 95.
*Inspection of Oysters. G. W. Snook.—p. 101.
Suggestions on Immobilization of Hand. D. R. Pratt.—p. 105.
X-Ray Department in Southwest Pacific Area. D. Tucker and A. J. Tillinghast.—p. 109.
Colostomies. C. H. Keene.—p. 115.
Canoscope: Improvised Projector. H. J. Hopkins.—p. 118.

Inspection of Oysters.—Snook states that oysters contain both protein and carbohydrates. When these decompose, fermentation as well as putrefaction occurs. Following the death of the oyster, which occurs soon after shucking, the glycogen is hydrolyzed to produce sugars, which in turn are fermented by bacteria to produce acid. Acid production is gradual, and a direct relation exists between hydrogen ion concentration and the stage of decomposition. The edibility of oysters can be determined readily by the use of p_H tests. Freshly shucked oysters normally show a p_H of between 6.3 and 7.1. When the p_H drops to between 5.7 and 5.9 the oysters are considered "stale," and when a p_H below 5.7 is reached they are considered "sour." The edible zone is thus above a p_H of 5.9. If oysters are kept under proper refrigeration, the lower limit of the edible zone, that is, a p_H of 5.9, is reached about eleven days after shucking. For reliable p_H readings it is advisable to use the Taylor slide comparator, a La Motte block comparator or a potentiometer. Nitrazine paper should not be used. Milky liquor is a normal property of oysters, but when in doubt a p_H reading is necessary. The only satisfactory method of preventing spoilage of freshly shucked oysters is the liberal use of ice. Green oysters should not be rejected. This condition is caused by the accumulation in the gills and mantle of the oyster of a bluish or greenish pigment derived from certain types of diatoms which normally live in sea water and are ingested by the oyster. Pink oysters are stale.

Canadian Journal of Public Health, Toronto

36:47-86 (Feb.) 1945

Surveys and Health Insurance. I. Schultz.—p. 47.
Public Health Aspects of Venereal Disease Control. R. P. Vivian. —p. 53.
Organization of Laboratory Services: Observations from Recent Visit to Britain. G. D. W. Cameron.—p. 58.
Medical Intelligence in United States Army. G. W. Anderson.—p. 65.
*Errors in Applying Nutrient Allowances to Dietary Surveys or Food Policies. L. B. Pett.—p. 69.

Nutrient Allowances in Food Policies.—Pett shows that innumerable combinations of individual foodstuffs are capable of providing optimal nutrition. This is fortunate because it permits adaptation to the wide variations observed around the world in dietary habits, in agricultural possibilities and in food composition. Standards have been devised from time to time. The most detailed of such tables is that of the United States National Research Council drawn up in 1941-1942. Serious errors may result when attempts are made to interpret such standards in terms of foods and in terms of national and international food requirements and agricultural policies. Physiologic experiments show a variation in individual susceptibility or requirements. Out of 97 persons a balance between intake and output of calcium was achieved for 22 persons with less than 0.35 Gm. daily, while 54 persons were in balance with between 0.35 and 0.55 Gm. of calcium daily, and 3 needed over 0.70 Gm. daily. The mean or average for this group is between 0.40 and 0.45 Gm. of calcium daily. In order to allow for unknown factors, the recommended allowance in the standard is 0.8 Gm. Only a small fraction of a population group needs this much; nearly half of the group could be in calcium balance with a calcium intake of only 50 per cent of the standard. Standards are also used as points of reference for dietary surveys. Current efforts to plan national or international food policies may lead to serious errors unless account is taken of the lack of knowledge on how to apply "standards" or "requirements" for various nutrients to population groups.

Hawaii Medical Journal, Honolulu

4:129-149 (Jan.-Feb.) 1945

Outbreak of Fish Poisoning in Honolulu, Hawaii. R. K. C. Lee and H. Q. Pang.—p. 129.
A Doctor Looks at Automobile Accidents. W. J. Holmes.—p. 133.
Use of Weltmann Reaction in Myocardial Infarction. A. S. Hartwell. —p. 136.

Journal of Nutrition, Philadelphia

29:85-154 (Feb.) 1945

*Effects of Light Intensity, Day Length, Temperature and Other Environmental Factors on Ascorbic Acid Content of Tomatoes. K. C. Hamner, L. Bernstein and L. A. Maynard.—p. 85.
Short Period Blood Sugar Time Curves Following Ingestion of Sucrose. I. M. Rabinowitch.—p. 99.
Neuropathologic Studies of Pantothenic Acid, Biotin and Folic Acid Complex Deficiencies in Chick. J. H. Shaw and P. H. Phillips. —p. 107.
Neuropathologic Studies of Acute and Chronic Thiamine Deficiencies and of Inanition. J. H. Shaw and P. H. Phillips.—p. 113.
Effects on Albino Mouse of Feeding Diets Very Deficient in Each of Several Vitamin B Factors (Thiamine, Riboflavin, Pyridoxine and Pantothenic Acid). J. H. Jones, Claire Foster, Frieda Dorfman and Gladys L. Hunter, with the technical assistance of Mabel E. Quinby and Dorothy L. Alexander.—p. 127.
Nicotinic Acid, Pantothenic Acid, Choline and Biotin Content of Fresh, Irradiated Evaporated and Dry Milk. A. Z. Hodson.—p. 137.
Effect of Succinylsulfathiazole and Phthalylsulfathiazole on Bacterial Flora of Rat Feces. A. Kathrine Miller.—p. 143.

Environment and Ascorbic Acid Content of Tomatoes.—Hamner and his associates studied the influence of environmental variables on the ascorbic acid content of tomatoes in the field and under controlled conditions in the laboratory. Neither the nature of the soil nor fertilization has been found to exert a great effect. There is also little evidence that the location effects can be ascribed to differences in temperature, humidity or variations in day length. The one variable so far studied which seems to exercise great effects is light intensity. Greatest influence on ascorbic acid content was produced by variations in light intensity previous to harvest. Increases in the ripe fruit of 66 per cent in ascorbic acid resulted when plants were transferred from shade to sunshine at the time the fruit was mature green. The light intensity to which the plants are exposed just previous to harvest may be the dominant factor in determining the ascorbic acid content of ripe fruit.

Journal of Pediatrics, St. Louis

26:107-208 (Feb.) 1945

*Analysis of Duodenal Drainage in Steatorrheas. H. F. Philipsborn, Grace Lawrence, S. Gibson and H. Greengard.—p. 107.
Observations on Child Populations, Birth and Infant Death Rates, Medical Personnel in Certain Countries. J. B. Gillespie.—p. 120.
Chronic Stridor in Early Life Due to Persistent Right Aortic Arch. H. K. Faber, J. W. Hope and F. L. Robinson.—p. 128.
Tuberculous Pleurisy with Effusion in Infancy. J. B. Hardy and E. L. Kendig.—p. 138.
Purulent Parotitis in Newborn. H. N. Sanford and I. Shmigelsky. —p. 149.
Diagnostic Methods in Whooping Cough. N. Silverthorne, V. Zacks and E. Jenkins.—p. 155.
Electrocardiographic Studies in Asthmatic Children. H. T. Engelhardt and V. J. Derbes.—p. 160.
What is Guillain-Barré Syndrome? F. H. Lewey.—p. 165.
*Calcification of Intervertebral Disks in Childhood. H. S. Weens.—p. 178.
Postwar Developments in Child Health Study in Great Britain. A. Moncrieff.—p. 189.

Duodenal Drainage in Steatorrheas.—According to Philipsborn and his associates fibrocystic disease of the pancreas and celiac disease may resemble each other closely. Fibrocystic disease is characterized by an achylia or hypochylia

pancreatica. Celiac disease is considered a failure of absorption of already digested foodstuffs. Since the stools in celiac and fibrocystic disease may be identical and because the vitamin A curve is diagnostically nonspecific, quantitative analysis of the duodenal drainage for enzymatic activity coupled with a notation of the response of the pancreas to secretin or intraduodenal hydrochloric acid is the most reliable laboratory aid in the differential diagnosis of fibrocystic and celiac disease. "Feeding problems" may be on the basis of a temporary pancreatic insufficiency. Permanent pancreatic insufficiency with infantilism must be differentiated from celiac disease, fibrocystic disease and certain types of feeding problems. The value for tryptic activity is the most reliable index of pancreatic function. Values of less than 4 Gm. of liberated nitrogen per hundred cubic centimeters of duodenal fluid are abnormal in children. Less than 0.5 Gm. of liberated dextrose per hundred cubic centimeters of duodenal drainage during the first twelve months of life is abnormal. Subsequently less than 2 Gm. of liberated dextrose is abnormal in children. When less than 60 cc. of twentieth normal sodium hydroxide is required to neutralize the free fatty acids produced by the lipolytic activity of 100 cc. of duodenal fluid the pancreatic lipase may be considered diminished in children. The enzymatic activity in the duodenal drainage is greatly diminished in fibrocystic disease; it remains essentially normal in celiac disease. The response to intravenous secretin or intraduodenal tenth normal hydrochloric acid is reduced in fibrocystic disease but may remain normal in celiac disease and in transient and permanent hypochylia pancreatica.

Calcification of Intervertebral Disks in Childhood.—Weens says that instances of calcification of the intervertebral disks have been observed in childhood. He reports 1 case that he observed and reviews 5 cases from the literature. Contrary to observations in adult life, prominent clinical signs and symptoms were noted. All of the cases were characterized by an acute episode of pain in the region of the involved segment of the spine, limitation of motion and spinal deformity. In the absence of pathologic studies it is not possible to arrive at definite conclusions as to the etiology of this phenomenon in childhood. Signs and symptoms of infection were noted in most of the cases, and these suggest that an inflammatory process was associated with the calcification. The fact that the intervertebral disks in childhood possess a blood supply may be important in this connection. The intervertebral disks are thus open to any disease carried by the blood stream. An aseptic necrotic process as a possible cause of the calcification is mentioned. The author stresses differences between calcification of intervertebral disks in childhood and in adult life. Involvement of the cervical spine was noted in 4 of 6 cases occurring in childhood. Calcification of the nucleus pulposus in adult life is localized predominantly in the dorsal spine and lumbar spine. Rapid change in the size of the calcification or complete absorption was noted in 5 of the 6 described cases. Calcification of the nucleus pulposus in adult life is, as a rule, a stationary process. All of the children recovered. The recognition of calcification of intervertebral disks in children appears important in view of the differential diagnosis of meningitis, myositis and diseases involving the vertebrae or spinal cord.

Journal of Thoracic Surgery, St. Louis

14:1-82 (Feb.) 1945

Pulmonary Resection in Treatment of Tuberculosis: Introductory Remarks. F. S. Dolley.—p. 1.
Total and Partial Pneumonectomy in Treatment of Pulmonary Tuberculosis. R. M. Janes.—p. 3.
Lobectomy for Pulmonary Tuberculosis. H. C. Maier and R. Klopstock.—p. 20.
*Primary Upper Lobectomy versus Modern Selective Thoracoplasty in Treatment of Tuberculosis: Physiopathologic Considerations. J. M. Chamberlain.—p. 32.
Pulmonary Resection in Treatment of Tuberculosis: Preliminary Report. R. H. Overholt and N. J. Wilson.—p. 55.

Lobectomy versus Thoracoplasty.—The evaluation of primary upper lobectomy and of selective thoracoplasty convinced Chamberlain that thoracoplasty is successful because it utilizes four of the five basic principles of therapy in tuberculosis: (1) drainage (bronchial), (2) immobility, (3) relaxation and (4) compression. The fifth principle, resection, is reserved for its failures. Primary upper lobectomy excises only the active major focus and causes overdistention, which is probably a precursor to emphysema, may cause reactivation of latent foci in the overdistended lobes and leaves these foci in a poor state of healing or self protection. Primary upper lobectomy may prove to be a less physiologic procedure than the modern selective six rib thoracoplasty, since the latter shows a significant reduction in function in only 25 per cent of the cases. Upper lobectomy should be secondary to the thoracoplasty failure.

New England Journal of Medicine, Boston

232:181-210 (Feb. 15) 1945

What About Health Insurance? R. I. Lee.—p. 181.
McMurray Osteotomy for Nonunited Hip Fractures. O. J. Hermann.—p. 186.
Vaginal Bleeding from Potassium Permanganate as Abortifacient. J. F. McDonough.—p. 189.
Physical Medicine in Rehabilitation. A. L. Watkins.—p. 191.

232:211-240 (Feb. 22) 1945

*Herniated Intervertebral Disk: Analysis of 400 Verified Cases. J. L. Poppen.—p. 211.
Cardiac Failure Associated with Acute Anemia. T. D. Kinney and G. K. Mallory.—p. 215.
Bloodless Circumcision. J. M. Birnie.—p. 218.
Diabetes Mellitus. E. P. Joslin.—p. 219.

Herniated Intervertebral Disk.—Poppen studied 400 surgically proved cases in which eighteen months to ten years have elapsed since surgical intervention. This series represents 8 per cent of the patients who entered the clinic with the complaint of low back pain. This emphasizes that even though the herniated disk is an important cause of low back pain and sciatica it is by no means the predominant one. The most constant objective finding was a positive straight leg reaction, which was present in 90 per cent of the patients when the protrusion was at the third, fourth or fifth lumbar segment. Seventy-five per cent of the patients demonstrated spasm of the low back muscles. Localized paraspinous tenderness was present in 80 per cent. Forty-eight per cent had sensory changes in the fifth lumbar or first sacral dermatomes or both. Narrowing of the disk space was not an assurance that a posterior dislocation of a disk was present. A normal roentgenogram of the low spine in the presence of a typical history and findings is an additional indication of the probable presence of a ruptured cartilage. A patient who has had repeated disabling attacks of sciatica necessitating narcotics and who in the previous few months has been unable to work because of a ruptured cartilage should have an operation. When a patient has had mild recurrences of symptoms causing considerable discomfort but not severe enough to discontinue work, he should be treated conservatively with physical measures in the form of heat, massage and postural exercises, rest in bed on a firm mattress and administration of large doses of vitamin B intravenously for a few days. Patients with predominating leg pain and with minor back difficulty whose roentgenograms show no bone changes should have only the disk removed, whereas for a patient who has predominating back pain, with abnormal facets and evidence of an unstable back, and who has to do hard manual labor, removal of the degenerated cartilage with fusion is indicated. There were no deaths or paralysis in any of the patients operated on. Infection occurred in 3 patients, but opening the incision and allowing adequate drainage with liberal use of the sulfonamide drugs brought about wound healing. The shortest postoperative stay in the hospital was four days and the longest five weeks; the average stay was twelve days. The relief of sciatica was satisfactory in most of the cases. Residual back discomfort on heavy lifting or sitting in a cramped position for many hours occurred in almost half the patients. This percentage was not materially altered in those who also had fusions. Fifteen per cent of patients did not obtain relief. Six cases in a series not treated surgically developed sudden complete paraplegia as a result of ruptured cartilage. Even though the protruded cartilages were removed in a relatively short time following the paralysis, many weeks and months elapsed before complete function returned.

Surgery, Gynecology and Obstetrics, Chicago

80:225-336 (March) 1945

Pancreatic Collections (Pseudocysts) Following Pancreatitis and Pancreatic Necrosis: Review and Analysis of 10 Cases. R. D. Pinkham. —p. 225.

Strength Frequency Curves in Electrodiagnosis of Experimentally Produced Peripheral Nerve Lesions in Cat. L. J. Pollock, J. G. Golseth and A. J. Arieff.—p. 235.

Fascia-Patch Transplant in Repair of Hernia. A. O. Singleton and O. W. Stehouwer.—p. 243.

*Total Pancreatectomy, Total Gastrectomy, Total Duodenectomy, Splenectomy, Left Adrenalectomy and Omentectomy in Diabetic Patient, Recovery. A. Brunschwig, H. T. Ricketts and R. R. Bigelow.—p. 252.

Pantopaque Myelography as an Aid in Preoperative Diagnosis of Protruded Intervertebral Disks: Preliminary Report. F. A. Echlin, J. McK. Ivie and A. Fine.—p. 257.

*Malaria from Blood Bank Transfusions. R. D. McClure and C. R. Lam. —p. 261.

Statistical Analysis of Study of Prevention of Infection in Soft Part Wounds, Compound Fractures and Burns, with Special Reference to Sulfonamides. F. L. Meleney, with foreword by A. O. Whipple. —p. 263.

*Absorption of Sulfonamides from Burn Surface. E. I. Evans, M. J. Hoover and G. W. James.—p. 297.

Closure of Defects of Skull with Tantalum. W. J. Gardner.—p. 303.

Intravenous Injection of Protein Digest Solution in Surgical Patients. C. S. White and J. J. Weinstein.—p. 313.

Practical Considerations in Definitive Amputation Surgery. H. W. Woughter and E. E. Myers.—p. 319.

Conservative Management of Adolescent Slipping of Capital Femoral Epiphysis. R. D. Moore.—p. 324.

Total Pancreatectomy, Gastrectomy, Duodenectomy, Splenectomy, Left Adrenalectomy and Omentectomy in Diabetic Patient.—Brunschwig and his associates report that a man aged 53 was admitted to a hospital with a complaint of watery, foamy stools for the previous two years and a loss of 50 pounds (23 Kg.). The presence of steatorrhea was confirmed and the patient was found to be severely diabetic. X-ray examinations of the stomach, duodenum, chest and colon were negative. Laparotomy was not indicated, as improvement occurred on medical management without pain. The patient was readmitted six months later because of moderately severe icterus, pruritus and pain in the right upper quadrant. Exploratory laparotomy revealed carcinoma of the body of the pancreas with invasion of the adjacent viscera. The patient was subjected to a total pancreatectomy, total gastrectomy, splenectomy, total duodenectomy and left adrenalectomy. The diabetes was not aggravated following the operation; there were periods when the diabetes appeared to be less severe than before operation. With a caloric intake equivalent to about 2,500 (400 Gm. of carbohydrate) the insulin requirements were 30 units of protamine and 10 units of regular insulin daily. Experience with this patient demonstrates the feasibility of very radical resections for abdominal cancer. Two and a half months after the operation the patient was in fair condition and ambulatory, but a month later he died and necropsy revealed abdominal carcinomatosis.

Malaria from Blood Transfusions.—Two patients were infected with blood that had been refrigerated for five days. A woman aged 57 developed malaria after a transfusion with bank blood, the donor having been a man aged 50 who had been born in Sicily and who at the age of 10 had had chills and fever for four months; he had been living in Michigan since the age of 16; an ordinary blood smear made on the donor after the transfusion was negative for malarial parasites. A white woman aged 23 developed malaria following transfusion of bank blood; her donor also had been a man born in Sicily, who had lived in this country since the age of 19. Since addition of quinine to the blood has been without effect, prophylactic administration of the drug to the recipient has been suggested, whenever questionable blood is being given. McClure and Lam state that the proper screening of donors is the logical means of preventing malarial transmission and that questions relating to geography would probably be more effective than those regarding past illness.

Absorption of Sulfonamides from Burn Surface.—Evans and his associates show that absorption of sulfonamides from a burn surface is limited when oil base ointments are employed. In contrast, when a water dispersible base is used toxic blood levels of the drug may occur. Studies on burned patients indicate that oil base sulfonamide ointments can be used with safety; their use has been attended with gratifying results of low incidence of infection. An oil base composed largely of mixtures of lanolin and petrolatum has proved very satisfactory.

Surgery, St. Louis

17:153-318 (Feb.) 1945

Problem of Thromboembolism. G. de Takats and E. F. Fowler.—p. 153.

*Etiology and Prevention of Thrombosis of Deep Leg Veins. W. C. Hunter, J. J. Krygier and J. C. Kennedy.—p. 178.

Postoperative Pulmonary Embolism. J. S. McCartney.—p. 191.

*Use of Dicumarol in Prevention of Postoperative Thrombosis and Embolism, with Special Reference to Dosage and Safe Administration. N. W. Barker, H. E. Cromer, M. Hurn and J. M. Waugh.—p. 207.

Surgery of Deep Venous Thrombosis of Lower Extremity. J. R. Veal and H. H. Hussey.—p. 218.

*Surgical Therapy of Thrombosis of Deep Veins of Lower Extremities. J. Fine and A. Starr.—p. 232.

Intravenous Clotting. A. Ochsner.—p. 240.

Disaster Following Femoral Vein Ligation for Thrombophlebitis; Relief by Fasciotomy; Clinical Case of Renal Impairment Following Crush Injury. C. Dennis.—p. 264.

Sensation of Gas Stoppage During Onset of Acute Appendicitis. E. L. Keyes.—p. 270.

Urologic Problems Associated with Surgical Treatment of Carcinoma of Rectum. J. A. Lazarus.—p. 284.

Conservative and Operative Treatment of Lesions of Intervertebral Disk in Low Back. J. A. Key.—p. 291.

Cranioplasty with Tantalum Plate. H. Echols and J. A. Colclough. —p. 304.

Thrombosis of Deep Leg Veins.—Hunter and his associates present a comparative study of the incidence of venous thrombosis in the legs in 400 unselected necropsies on adults performed before and after preventive measures were instituted. In the first group the authors routinely removed the calf muscles in order to test their conviction that the most important etiologic factor in phlebothrombosis of the lower extremities is confinement to bed for more than a brief period. The second study was extended to include dissection of the femoral veins and those of the abductor muscles, shown by Frykholm to be almost as frequently occluded as the major veins. The authors found that phlebothrombosis of the lower extremities begins in the deep vessels of the calf and tends to propagate toward the heart, and that thrombosis of the femoral veins alone is an uncommon occurrence. Thrombosis of the deep veins of the leg is a frequent event in all classes of middle aged and older patients who must go to bed for longer than a few days. The onset is insidious and without prominent symptoms. Phlebitis, as a cause or as a complication of deep extremity vein thrombosis, is uncommon and for this reason is unimportant. The logical approach to the problem of phlebothrombosis and pulmonary embolism is prophylactic. The authors stress the importance of leg exercises after operations and in other bedfast patients. Reeducation of physicians and nurses with respect to the causes of thrombosis of the legs is urgently needed. The incidence of phlebothrombosis in medical patients proved to be significantly less than it was in the first 200 cases. It seems probable that the institution of active exercises for this group is responsible for the decrease.

Dicumarol in Prevention of Postoperative Thrombosis and Embolism.—One thousand surgical patients were given dicumarol in the immediate postoperative period for the purpose of preventing postoperative venous thrombosis, pulmonary embolism and thrombophlebitis. Barker and his associates have found it effective in preventing these complications in cases in which there had been nonfatal pulmonary embolism, thrombophlebitis or a history of previous thrombosis or embolism and when the drug was given prophylactically if no thrombosis or embolism had occurred. There is a small risk of bleeding. This can be minimized by proper administration of the drug and rapid control of excessive prothrombin deficiency. Dicumarol should not be given unless prothrombin time tests are done daily. The prothrombin level should be kept between 10 and 30 per cent of normal. Excessive prothrombin deficiency produced by dicumarol can almost always be controlled by the intravenous administration of large doses (60 to 64 mg.) of menadione bisulfite (synthetic vitamin K). If bleeding occurs as the result of excessive prothrombin deficiency it can be controlled by transfusions of freshly drawn citrated blood and intravenous administration of large doses of menadione bisulfite.

Surgical Therapy of Thrombosis of Lower Extremities.—Fine and Starr show that heparin and dicumarol are useful but not thoroughly dependable agents for the prophylaxis of pulmonary embolism. Their use is furthermore complicated by hemorrhage in wounds and elsewhere, which has occasionally proved fatal. The surgical prophylaxis of pulmonary embolism is the procedure of choice among those who prefer a more direct and immediately applicable method for blocking the discharge of an embolus. The risks of ligation of the common femoral, the iliacs and possibly also the vena cava are minimal and are accompanied by little postoperative disturbance except for transitory increase in edema in occasional instances. The selection of the level of ligation is made on the basis of the extent of involvement: (*a*) The common femoral vein is ligated when thrombophlebitis is limited to the veins below the knee or when pulmonary embolism has occurred in the absence of all signs of involvement; (*b*) the common iliac is ligated when thrombophlebitis involves the common femoral, external or common iliac veins; (*c*) the vena cava is ligated when the indications are that both common iliacs require ligation. Since the frequency of bilateral involvement is high, bilateral vein ligation is generally indicated. The occurrence of spastic narrowing or obliteration of venous channels limits the diagnostic usefulness of venography. The distinction between quiet venous thrombosis and full blown thrombophlebitis, that is, phlegmasia alba dolens or milk leg, is not a dependable means of deciding when a clot is detachable and when it is not. Therefore, exploration in most cases of so-called milk leg is advisable. Early mobilization after operation does not provide full security against the development of thrombophlebitis.

United States Naval Med. Bulletin, Washington, D. C.

44:225-452 (Feb.) 1945. **Partial Index**

*Immersion Blast Injury: Clinical Experiences. E. L. Gage.—p. 225.
Pathology of Immersion Blast Injury. A. Yaguda.—p. 232.
Report of Injuries Among Survivors of Airplane Crash. J. S. Thiemeyer Jr.—p. 241.
Delayed Acute Aero-Otitis Media and Methods of Prevention. W. J. Brown.—p. 247.
Medullary Canal Wire Transfixion in Metacarpal and Forearm Fractures. R. D. Long and H. C. Fett.—p. 253.
Haynes External Fixation Splint in Treatment of Lower Extremity Fractures. W. M. Cashman.—p. 257.
Injection Treatment of Flat Feet. H. E. Hipps and H. Neely.—p. 262.
Diarrheal Diseases in Navy: Navy's Experience, 1882-1942. D. F. Smiley and H. A. Raskin.—p. 267.
Use of Paredrine Hydrobromide: Parahydroxy-a-Methyl-Phenyl-Ethylamine Hydrobromide in Control of Cardiac Arrhythmias, with Review of Literature. G. C. Griffith.—p. 284.
*Venopressor Mechanism in Production of Shock: Its Treatment with Nikethamide. L. Gunther.—p. 300.
Medicine in South Pacific. A. M. Master.—p. 308.
Special Problems in Acute Rheumatic Fever. A. C. Wyman.—p. 316.
Suppression of Urine Complicating Sulfadiazine Therapy. L. V. Smiley. —p. 328.
Fluoroscopic Hazards, Including Use of Unprotected Radiographic Screens. C. F. Behrens.—p. 333.
Electroencephalography in Study of Chronic Behavior Problems: Review. O. A. Will Jr.—p. 341.
Sclerosing Agent in Treatment of Subluxation of Mandible and of Hemangiomas of Mouth. I. Salman.—p. 361.
So-Called Reiter's Disease: Triad of Acute Arthritis, Conjunctivitis and Urethritis. H. H. Rosenblum.—p. 375.
Meningitis in an Island Naval Air Station Dispensary. S. M. Dillenberg.—p. 379.

Immersion Blast Injury.—Gage reports observations on 98 men who had survived a sinking at sea and subsequent depth charge explosion. Serious intra-abdominal injury occurred in 23 patients. Since these patients were received thirty-six hours after injury, conservative treatment was decided on. Morphine was given freely to overcome shock, to relieve pain and to reduce intestinal activity. No patient was given food or an enema until it could be determined that no intra-abdominal injury was present. Plasma, dextrose or saline solution was given as indicated. In 10 instances it was necessary to pass a Miller-Abbott or Wangensteen suction tube. At the end of ten days 35 of the 98 patients remained in the hospital, 58 had been discharged and 5 had died. Four of the deaths occurred in seven, twenty-seven, thirty and forty-two hours respectively, the cause being generalized peritonitis. At no time were these patients in condition for operation. The fifth death occurred at the end of five days from pooled plasma anaphylaxis. Nearly all the injured men reported that they felt as if they had been kicked in the painful area (stomach, back, testes) when the depth charge went off. All but 2 of the patients with serious abdominal injury estimated that they were within 100 feet of the depth charge when it went off. A study of the severe abdominal injuries shows that when the depth charge exploded all these men were on their abdomens or were in water above the abdomen and facing the blast. The advisability of allowing no food or activity until careful examination has been made cannot be overemphasized. Surgical intervention might have been deemed necessary in some instances had the patients been hospitalized within ten to twelve hours after the explosion. Secondary perforation of a viscus occurred in 2 patients, in 1 as late as forty days after the injury. One man who was promptly operated on recovered. Gage is inclined to believe that, with the excellent supportive treatment received, recovery might have occurred without operation. This does not mean that patients with immersion blast injuries with perforation, rescued early, should not be operated on; however, when the optimum period for operation has passed, nonoperative treatment can help save many lives.

Venopressor Mechanism in Shock: Treatment with Nikethamide.—According to Gunther peripheral circulatory failure is always associated with and preceded by a decline in intramuscular pressure. Shock, observed under these circumstances, is never manifest without a low intramuscular pressure. The value for intramuscular pressure may be found as low as 20 mm. of water. This level indicates a complete absence of muscle tonus and a complete failure of the venous pump. An increase in intramuscular pressure, either spontaneously or induced by treatment, to above 40 mm. of water always coincides with compensation of a failing peripheral circulation. Of the many substances studied, only two accomplished a restoration of a low intramuscular pressure. These were human plasma and a 25 per cent solution of pyridine-beta-carboxylic-acid-diethylamide, which is known as nikethamide. Human plasma acts slowly, requiring from seventy to one hundred minutes to manifest its pressor action on the venopressor mechanism. Nikethamide acts rapidly, manifesting its pressor action on the venopressor mechanism within five to ten minutes, but the effect does not last as long as with plasma. The intravenous administration of nikethamide in adequate dosage will support the venopressor mechanism during the time needed for plasma to become effective. Nikethamide is to be used as an adjunct before or concurrently with plasma. Nikethamide is relatively without toxicity. It must be given in large amounts intravenously to be effective. It is not effective for restoration of muscle tonus when administered by mouth or intramuscularly.

Virginia Medical Monthly, Richmond

72:99-148 (March) 1945

Narcosynthesis and Hypnotism. A. M. Duval.—p. 101.
Radiation and Neurosurgery in Advanced Cancer. G. Cooper and V. W. Archer.—p. 108.
Relationship of Soil Fertility and Psychic Reactions, J. A. Shield. —p. 114.
Cleidocranial Dysostosis: Report of Case. F. G. Repass.—p. 121.
Minimal Pulmonary Tuberculosis. E. S. Ray.—p. 125.
Diphtheria in 19 Day Old Baby. C. W. R. Smith.—p. 128.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

53:65-92 (March) 1945

Thiouracil (Deracil): Study of its Use in 43 Cases of Thyrotoxicosis. J. R. Montague and C. P. Wilson.—p. 65.
Cervical Pregnancy. C. L. Fearl.—p. 71.
*Use of Vitallium Tube in Stricture of Common Bile Duct. J. H. Saint.—p. 73.
Aids in Management of Varicose Veins. E. F. Gooel.—p. 80.
Clinical Significance of Chronic Gastritis. M. E. Dailey.—p. 85.
Appendectomy on Poliomyelitis Patient in Drinker Respirator. D. Metheny and H. H. Olson.—p. 88.

Vitallium Tube in Stricture of Common Bile Duct.—Saint reports a case in which an initial stricture of the common bile duct was treated by permanent intubation with a vitallium tube. The patient made a satisfactory recovery and is in good health up to the time of writing, nineteen months after her operation. Results so far reported are encouraging enough to warrant the further use of the tube in selected cases.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine, Liverpool

38:159-222 (Dec. 20) 1944. **Partial Index**

Second Report on Treatment of Trypanosomiasis by Pentamidine. G. F. T. Saunders, J. R. Holden and M. H. Hughes.—p. 159.

Investigations in Chemotherapy of Malaria in West Africa: II. Malaria Suppression—Quinine and Atabrine. G. M. Findlay and A. C. Stevenson.—p. 168.

Use of Penicillin for Obtaining Bacteria-Free Cultures of Trichomonas Vaginalis Donné, 1837. S. Adler and R. J. V. Pulvertaft.—p. 188.

New Keys to West African Anophelini. P. F. Mattingly.—p. 189.

Investigations in Chemotherapy of Malaria in West Africa: III. Further Investigations on Treatment With Quinine and Atabrine. G. M. Findlay, J. L. Markson and J. R. Holden.—p. 201.

Notes on Fatal Case of Yellow Fever. R. Kirk and A. Bayoumi.—p. 205.

Prophylactic Effect of Soaps Impregnated Respectively with Tetraethylthiuram Monosulfide and with Benzyl Benzoate When Used Once Daily to Wash Rats Exposed to Infection with Scabies Due to Notoëdres. R. M. Gordon and K. Unsworth.—p. 207.

British Journal of Urology, London

16:125-168 (Dec.) 1944

Tuberculosis of Prostate. A. and E. de la Peña.—p. 125.

Clinical Use of 100,000 Units of Penicillin in Sulfa-Resistant Gonorrhea: Report of 112 Cases. C. J. Schmidlapp, N. L. Bosworth and L. W. Riba.—p. 133.

Indian Medical Gazette, Calcutta

79:455-510 (Oct.) 1944

Cerebral Malaria: Pathogenesis, Symptoms and Treatment. R. Viswanathan.—p. 455.

Developing Gametocytes and Schizonts of Plasmodium Falciparum: Case Showing All Stages in Peripheral Circulation. B. M. Das Gupta and S. K. Ganguli.—p. 458.

*Early Diagnosis of Kala-Azar. J. Lowe.—p. 459.

*Value of Complement Fixation Test in Diagnosis of Kala-Azar. P. C. Sen Gupta.—p. 465.

Quality of Indian Made Synthetic Drugs: II. Examination of Iodochlorhydroxyquinoline (Enterovioform) of Indian Manufacture. J. C. Pal, B. Mukerji, J. C. Gupta and M. L. Chatterjee.—p. 469.

Anacidity in Gastric Cancer. R. G. Chitre and V. G. Samant.—p. 472.

Case of Military Tuberculosis of Serous Membranes with Nontuberculous Brain Abscess. B. I. S. Bhalla and P. N. Bardhan.—p. 476.

Transmission of Kala-Azar in India: Case Against Sandfly. R. H. Malone and A. G. Brooks.—p. 484.

Early Diagnosis of Kala-Azar.—According to Lowe, present conditions in eastern India favor an epidemic of kala-azar. In the past, diagnosis was usually delayed until the third or fourth month of fever. Earlier diagnosis was often impossible because spleen puncture is advisable only when the spleen is considerably enlarged, and moreover the aldehyde and antimony tests become positive only after this period. Patients who developed kala-azar frequently suffered from recurring bouts of fever which were either untreated or treated as due to malaria or some other condition. The author presents reports of patients with kala-azar who have been seen early in the disease. The most constant finding in the early cases has been the irregular temperature of remittent nature with a relatively rapid pulse rate and the absence of severe toxemia. In the early diagnosis of kala-azar the general clinical picture and the nature of the fever are the most important considerations; sternal puncture with staining for Leishmania donovani provides the most reliable method of confirmation. The complement fixation test done with the Witebsky, Klingenstein and Kuhn antigen or some modification of it is the next most useful confirmatory measure. With clinical observations and the use of these tests, diagnosis should usually be possible within three weeks of onset.

Complement Fixation Test in Kala-Azar.—Sen Gupta reports from the Calcutta School of Tropical Medicine 920 cases in which the complement fixation test was done according to the technic described by Greval, Sen Gupta and Napier with an antigen prepared according to the Witebsky, Klingenstein and Kuhn method from Kedrowsky's bacillus. A positive reaction was obtained in 93 per cent, a doubtful reaction in 6 per cent and a negative reaction in 1 per cent of all cases of kala-azar. In 99 per cent of all cases likely to be considered in the differential diagnosis of kala-azar a negative reaction is obtained. In 1 per cent a doubtful reaction may be obtained. A positive reaction is obtained in a few cases of chronic pulmonary tuberculosis, but such cases are readily excluded by their clinical features. The antigen prepared from Kedrowsky's bacillus is somewhat inferior. It is probable that with the antigen prepared locally from the human tubercle bacillus better results will be obtained. This test provides a method of laboratory diagnosis at a stage when all other procedures except a sternal puncture are negative. In several cases the positive reaction was obtained within three weeks of onset. Specific treatment of kala-azar causes the reaction to become negative or produces a lowering of the degree of complement fixation.

Journal of Hygiene, London

44:1-66 (Jan.) 1945

Studies on Disinfecting Action of Hypochlorous Acid Gas and Sprayed Solution of Hypochlorite Against Bacterial Aerosols. W. J. Elford and Joan Van DenEnde.—p. 1.

Etiologic Factors in Bronchopneumonia Among Infants in London. G. P. Wright and H. P. Wright.—p. 15.

Study of Vi Agglutination Test for Detection of Typhoid Carriers. E. F. W. Mackenzie, and E. W. Taylor.—p. 31.

Bacteriologic Investigation into Causation of Diarrhea and Enteritis in Dublin in 1942-1943. S. Sevitt.—p. 37.

New Form of Reagent Against Perspiration Effects on Shoe Materials. A. Colin-Russ.—p. 53.

Influence of Salmonella Typhi-Murium Infection in Rats on Vitamin Metabolism. I. J. Kligler and K. Guggenheim.—p. 56.

Susceptibility of Vitamin A Deficient and Starved Rats and Mice to Peroral Infection with Salmonella Typhi-Murium. I. J. Kligler, K. Guggenheim and E. Henig.—p. 61.

Lancet, London

1:135-166 (Feb. 3) 1945

Compound Fractures in War: 1944. J. A. MacFarlane.—p. 135.

Decompression for Chronic Prostatic Retention. H. T. Cox.—p. 138.

*Pneumococcus Lobar Pneumonia: Results with Different Blood Levels of Sulfapyridine. A. Dick.—p. 141.

*Hemothorax. T. H. Sellors.—p. 143.

Determination of Plasma Mepacrine: Note on Anticoagulant.—p. 144.

Aspirin Poisoning: Report of Case. P. Hopkins.—p. 145.

Treatment of Burns with Partial Skin Destruction: Illustrative Case. D. H. Patey and R. W. Scarff.—p. 146.

Traumatic Anuria in Miner. A. Caplan and G. E. Dunkerley.—p. 147.

Cold Agglutination in Tropical Eosinophilia. R. Viswanathan and B. Natarajan.—p. 148.

Blood Levels of Sulfapyridine in Pneumonia.—Dick previously called attention to the fact that in Glasgow type II pneumococcus infections carried a fatality rate of about 14 per cent when only a sulfonamide drug was administered and that the addition of an autogenous vaccine failed to improve the results. A more intensive course of chemotherapy was suggested. Results of therapy in 161 patients with pneumonia as judged by the duration of primary pyrexia, the incidence of complications and the final outcome of the disease could not be correlated with the blood concentration of the drug. A more intensive course of chemotherapy in pneumonia does not appear to be justified, and there appears to be no reason for exceeding the recognized dosage of 2 Gm. initially followed by 1 Gm. every four hours.

Hemothorax.—In most hemothoraces the blood remains liquid. It is now generally recognized that clotting occurs, but the hematoma is rapidly defibrinated so that the actual gel form of clot is transposed into shreds of fibrin floating in a pool of liquid blood. To get some evidence on the behavior of intrapleural blood, investigations have been made on a number of hemothoraces. No instances of infected hemothorax has been included, since inflammation would alter the pleural reaction. Only those cases have been included in which the first two aspirations yielded at least 2 pints. The blood may reach a volume of several pints and in the free pleural sac this clots normally but is rapidly defibrinated. A liquid mass is formed in which fibrin shreds may be deposited. Fairly quickly a serous effusion develops, and it is this effusion that accounts for the main deposit of fibrin that complicates the later picture. The sooner the original hemothorax can be evacuated the better will be the chances of functional recovery. Clotted hemothorax is relatively rare, but coagulation of an effusion of high fibrinogen content gives rise to the clotted fibrothorax. In the presence of a clot—blood or fibrin—active surgery may be required. A small thoracotomy allows the cavity to be cleaned and in selected cases permits removal of the restricting layer of fibrous tissue over the lung. Breathing exercises are of great value in reestablishing full expansion of the collapsed lung.

Prensa Médica Argentina, Buenos Aires

32:1-64 (Jan. 5) 1945. **Partial Index**

Modern Concepts of Cerebral Vascular Syndromes. A. De Castro. —p. 1.
*Gastrectomy and Skeletal Decalcification. C. Bonorino Udaondo and M. R. Castex.—p. 3.
Hemostatic Action of Blood Plasma. A. Peralta Ramos and A. Pavlovsky.—p. 19.
*Ligneous Thyroiditis (Riedel's Disease): 2 Cases. F. Strada, V. Bertola and A. Ferraris.—p. 22.
Interosseous Arteries of Hand. H. Fracassi.—p. 27.
Thiouracil in Hyperthyroidism. S. E. Luchetti.—p. 34.
Paramesial Supraumbilical Eventrations: Repair with Fascia Lata. L. L. Fernández.—p. 37.
Sedimentation of Erythrocytes in Diphtheria. R. Maggi and D. Wencelblat.—p. 41.

Gastrectomy and Skeletal Decalcification.—Bonorino Udaondo and Castex report clinical, radiologic and chemical investigations on 41 patients who had undergone gastrectomy for gastric or duodenal ulcer or for gastric carcinoma or sarcoma. The time that had elapsed between the gastrectomy and the radiologic study and the investigation of the mineral metabolism varied between four months and twenty-one years, but in the majority three or more years had elapsed. The authors found that the incidence of osseous decalcification in the lumbosacral and pelvic bones (the only bones studied by them) was extremely frequent, and they believe that the digestive and nutritive status produced by the gastrectomy is the primary factor. The investigations revealed that there are other contributing factors in the causation of this osteomalacia, such as too little exposure to sunlight with deficient synthesis of vitamin D and insufficient ingestion of calcium in assimilable form due to inadequate alimentation and digestive disturbances. Cancer, advanced age and endocrine disorders are factors that create or intensify decalcification. Account should be taken of this combination of causes of osteomalacia in patients subjected to gastrectomy and recourse should be taken to measures that nullify the deleterious action of these factors, because preventive measures are usually more effective than is treatment of the established process.

Ligneous Thyroiditis.—Strada and his collaborators mention thyroid cirrhosis, petrous thyroiditis and several other terms for the condition which was first described by Riedel in 1896. They describe 2 cases of ligneous thyroiditis, 1 in a boy aged 15 and 1 in a woman aged 44. The diagnosis is based on three main symptoms: hardness, invasion of neighboring tissues and compression. Two other disorders cause considerable induration of the thyroid, namely cancer and Hashimoto's disease (struma lymphomatosa). Cancer can be differentiated by the grossly nodular surface and early metastases in the lymph nodes of the neck. In Hashimoto's disease, which some regard as the primary stage of ligneous thyroiditis, there exists a uniform enlargement of the entire gland, but the surface is smooth and slightly lobulated; there is no adherence to the neighboring organs, and it occurs almost exclusively in women of menopausal age. The treatment of ligneous thyroiditis consists in subtotal thyroidectomy in order to overcome the compression. It produces favorable results even if only a small part of the tumor is extirpated. In both of the reported cases the operation was well tolerated and great relief obtained.

Deutsche medizinische Wochenschrift, Leipzig

69:713-738 (Oct. 15) 1943

*Intensive Treatment of Malaria (Five Day Cure). A. Hauer.—p. 713.
Results of Treatment for Causalgia with Obliteration of Ganglions of Sympathetic Nerve. J. Hirschmann.—p. 717.
*Intrasternal and Intraosseous Injections and Infusions. N. Henning. —p. 720.
Natural Methods of Treatment for Decompensated Circulation in Rheumatic Cardiac Disorders. F. Pezold.—p. 722.
Treatment for Croupous Pneumonia with Sulfonamide Compounds. A. Dieckmann.—p. 725.
Cholecystography with Bilisectan and Rapid Cholecystography. H. Griessmann.—p. 726.
*Immunization Against Scarlet Fever in Camps of Hitler Youth. J. Wolff. —p. 727.

Five Day Cure of Malaria.—Hauer reports results of intensive treatment of 566 cases of tertian, quartan and tropical malaria during the period from December 1942 to June 1943. A five day course was practiced. One tablet of 0.01 Gm. of plasmochin three times daily and two tablets of 0.1 Gm. of atabrine three times daily were given for the first three days. One tablet of 0.1 Gm. of atabrine three times daily was given on the fourth and on the fifth day. Hydrochloric acid was administered at the same time. Tolerance was convincingly good. The effects of the drugs as parasiticides and as antipyretics were at least the same as if not better than those of a ten or twelve day course which had been employed previously. The early effect of the plasmochin on the gametes may support the control of the mosquito borne infections in the endemic regions of tropical malaria. It is too early for a definite statement with regard to relapses, but it seems likely that the results of the five day course were not less favorable than those of the other methods. A large scale trial is recommended.

Intrasternal Infusions.—Intrasternal transfusions represent a satisfactory substitute in cases in which the intravenous route is not available. The intramedullary route is suggested for cases in which the veins of the extremities are obliterated or are too small. Intrasternal infusions are of the greatest value in wartime for emergency blood transfusions in cases of severe injuries complicated by collapse or shock. Because the needle remains fixed in the cortical substance, the sternal infusion method is indicated in motor unrest of various origin, such as that of diabetic coma, acute circulatory collapse, malignant diphtheria and drug poisoning. The intramedullary route is particularly suited for infants and young children. Henning opposes Tocantins' opinion that the femur or the tibia should be used instead of the sternum in children under 3 years of age. By inserting the needle at an angle, intrasternal injections and infusions may be used in infants. The intramedullary injection into any bone is to be considered in case of failure of the intrasternal injection. This failure may be caused by clotting of the bone marrow and may be prevented by flushing the cannula with a 3.8 per cent sodium citrate solution prior to puncture.

Immunization Against Scarlet Fever.—Children from various parts of Germany were brought to Lower Silesia, where the incidence of scarlet fever was high. Concentration of the children in camps where they had to live permanently, sharing meals and bedrooms, increased the risk of direct infection. Prophylactic active immunization was carried out with "Scarlet Fever Adsorption Vaccine K, Behring," a suspension of killed hemolytic streptococci in an attenuated toxin solution which had been adsorbed with aluminum hydroxide. The vaccine contained an antitoxic component in addition to the antibacterial component. Preliminary immunization experiments were carried out on 40 children whose Dick reaction was positive, 0.5 cc. of the new vaccine being given twice every two weeks. Dick tests were then repeated with negative result in all the children. There were no untoward reactions, such as fever or eruption, except for mild local reactions such as redness or swelling. The same good results were obtained from immunization of 58 children to whom 0.5 cc. of the vaccine was given three times at intervals of four weeks, and from the immunization of 400 children to whom 0.5 cc. of the vaccine was applied twice at an interval of two weeks. Mass immunization with two applications of the vaccine to the upper arm at a four weeks interval was carried out on 3,400 young people from 6 to 16 years of age. Diphtheria vaccine was given at the same time in the other arm. Not a single case of scarlet fever occurred in the camps. In some of the camps, with children between the ages of 10 and 14 years the immunization was performed with "Scarlatox-Asid-Vaccine" instead of the sacrlet fever-adsorption vaccine K, Behring. The difference between the two vaccines consisted in the purification method used for the toxin. Three applications at intervals of two weeks were made. Twenty-two children had temperatures up to 103 F. Headache and pharyngitis were present and an eruption occurred in 8 instances. The local conditions in the camp were believed to be responsible for these untoward reactions.

Book Notices

Endocrinology of Woman. By E. C. Hamblen, B.S., M.D., F.A.C.S., Clinical Professor of Endocrinology and Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine, Durham, North Carolina. Cloth. Price, $8. Pp. 571, with 157 illustrations. Springfield, Illinois: Charles C Thomas, 1945.

The author's decision, as stated in his preface, to prepare an essentially new book rather than to refurbish his former volume on Endocrine Gynecology, published in 1939, was a wise one. The present work is undoubtedly a great improvement over the earlier one, which contained much good material, but the arrangement was poor and it was difficult for the reader to find what he might be looking for. In the present streamlined volume, to use the author's own adjective, the subject matter is presented in a systematic and orderly fashion, under five chief subdivisions.

The first of these presents a short but adequate discussion of the history, embryology, anomalies, anatomy, physiology, chemistry and interrelations of the various endocrine glands. The second is devoted to applied endocrine physiology, including a discussion of the endocrines in the fetus and newborn, childhood and adolescence, together with a very satisfactory review of the endocrinology of menstruation and the climacteric. While this section incorporates a good deal of material from the author's previous volume, it has been brought up to date and attractively rearranged.

The third section, dealing with endocrine diagnostic methods, is one of the most valuable in the book. Not only does it describe the innumerable laboratory tests so often necessary in the diagnosis of endocrine problems but it also discusses such clinicolaboratory procedures as endometrial biopsy and vaginal smear study. Hamblen expresses skepticism as to the clinical value of vaginal smear studies, and in this skepticism we heartily concur.

The fourth part of the book deals with functional disorders of the endocrine glands, including many not closely related to the gynecologic field. There can be no criticism of this broad scope, since the gynecologic endocrinologist soon learns that he cannot interpret his problems intelligently if he tries to fence himself within pelvic limits.

The last section of the book deals with endocrinology applied to gynecologic disease and naturally includes the author's views as to the therapy of functional disorders. Curiously enough there is no mention of the treatment of amenorrhea, one of the most troublesome of gynecologic problems. The only plan of treatment of functional bleeding discussed is the author's method of "cyclic regulation" and "pituitary regulation." The plan of beating a dysfunctioning and probably refractory pituitary into cyclic submission by ovarian therapy sounds pretty, but, aside from the duration, expense, inconvenience and general ponderousness of the regimen it has not given as good results in the hands of others as appear to have been obtained by Hamblen. Throughout the book, and even in its preface, the author expresses undying opposition to androgenic therapy under any circumstances, and this extreme view seems unreasoning. He states that such treatment is always "unphysiologic," but so is the accepted diethylstilbestrol treatment of prostatic carcinoma, to mention only one of many possible examples. Every sensible gynecologist recognizes the limitations of androgen therapy as well as its hazards if employed indiscriminately, but many find a limited indication for its employment in this present makeshift era of organotherapy.

The chapter on dysmenorrhea is poor. Hamblen is evidently still a believer in the so-called nasal treatment of dysmenorrhea by cautery of Fliess's spots with trichloroacetic acid crystals, a curious anachronism in an otherwise modern textbook. It is impossible for any one in the present confused era of organotherapy to write a book which would meet the approval of all other endocrinologists, and many will question some of the therapeutic advice given by Hamblen, such as that of giving estrogens cyclically or according to a rather fixed schedule in the treatment of menopausal symptoms. The therapeutic section of this book will be definitely less valuable to its readers than those portions dealing with physiology and diagnosis.

The illustrations are numerous and well chosen, especially the photomicrographs illustrating all manner of endometrial patterns. The publishers have done a good job with typography and format. The book as a whole is one which can be warmly recommended as a very worthy addition to the ever increasing number of works devoted to this expanding field.

Pastoral Work and Personal Counseling. By Russell L. Dicks. Cloth. Price, $2. Pp. 230. New York: Macmillan Company, 1944.

This work by the chaplain of Wesley Memorial Hospital is written for the "average clergyman." The author has had considerable experience in dealing with illness and is co-author with Dr. Richard Cabot of "The Art of Ministering to the Sick." For this reason the book is of interest to the physician. The author stresses the lack of preparation of many clergymen for counseling with persons in conflict and feels that the physician and social worker have almost shouldered the clergyman out of his own field. The book deals with methods in approaching individual problems and correctly emphasizes the importance and nature of the relationship of the pastor to members of his church as counselor. By example and by records of interviews the author attempts to place before the reader his own basic attitudes and his actual experience. This is a candid, refreshing work, well suited to its purpose. Its scope is distinctly limited, since there is no pretense of presenting principles underlying the disturbing behavior or disturbed feelings of those whom the pastor attempts to aid. The present day theological student would wish more thoroughgoing ground work in psychology and psychiatry. The author is quite direct in delimiting problems to which the pastor should address himself and stresses the appropriate working relationship between pastor, social worker and physician. This is an honestly written book that evidences the warmth and human understanding of the author.

The Principles and Practice of Tropical Medicine. [Part I.] By L. Everard Napier, C.I.E., F.R.C.P., Director and Professor of Tropical Medicine, Calcutta School of Tropical Medicine. Cloth. Price, 25 rupees. Pp. 522, with illustrations. Calcutta: Thacker, Spink & Co. (1933), Ltd.; London: W. Thacker & Co., 1943.

Part I of a two volume work, the second of which is yet to appear, considers measures for mitigating the effects of tropical climate, diseases due to the direct effects of tropical climate, malaria, leishmaniasis, trypanosomiasis, the relapsing fevers, rat bite fever, the typhus fevers, Oroya fever, yellow fever, Rift Valley fever, the dengue sandfly fever group, plague, tularemia, the undulant fevers, meliodosis, the intestinal fluxes and leprosy. The work is admittedly an introductory textbook on tropical medicine and because of several excellent clinical descriptions and complete discussions of treatment it will be of particular value to medical students and clinicians. No attempt has been made to prepare a volume of reference for the advanced worker. Although the presentation of diseases gives major importance to the clinical side, the essentiality of proper laboratory procedures is adequately stressed. In this connection attention is called to the increased frequency with which the etiologic agents of tropical diseases may be demonstrated. The section on kala-azar reflects the author's knowledge of the disease and substantiates his rank as an authority on the subject. On the other hand, the conception that all primary infections with Endameba histolytica should be called "amebic dysentery" and all other symptoms should be considered as secondary to dysentery is at variance with most authorities on the subject. On the whole, the book is considered to be an excellent one for its purpose and should find wide use.

Etudes de psychologie médicale. Par André Ombredane, professeur de psychologie expérimentale à l'Université du Brésil, Rio de Janeiro. I. Perception et langage. II: Geste et action. Les publications savantes de l'École libre des hautes études du Brésil, 2,3. Paper. Pp. 189, with 12 illustrations; 129, with 7 illustrations. Rio de Janeiro: Atlantica Editora, 1944.

It would be difficult, if not impossible, to find in the modern literature of any country a more fundamental and exhaustive study of the problems presented here than this masterly work by André Ombredane. Only a man who commands the enormous literature of two continents dealing with aphasia, agnosia and apraxia and has the brilliance and experience of Ombredane

could give us such a critical analysis and synthetic presentation of this most difficult subject.

The author bases his chapter on aphasia on Baillarger's principle "the substitute of the involuntary verbal incitation for the voluntary one" and Hughlings Jackson's conception of diseases of the nervous system as reversed evolution, e. g. dissolution. Dissolution as a process of regression proceeds from the least organized, the most complex, the least automatic toward the most organized, the simplest and most automatic. In a uniform dissolution the highest centers are the most affected. A high (cortical) center tends to represent the whole of the organism in contrast to a low (for instance spinal) center, which represents an elementary organ capable of functioning independently of the rest of the organism. All the nerve centers are necessarily of sensory-motor constitution. There are stages of conscience corresponding to the different levels of central organization, their mental character being the more accentuated the more higher centers are engaged. Body parts predominantly employed in voluntary actions have a particularly important representation in the highest brain centers.

Under these conditions the internal evolution of the upper centers corresponds to a great multiplication of neural arrangements representing the muscles of the hands, the eyes, the speech, the retina, so much so that the dissociated or mental activity of the upper centers is in reality bound to the awakening of sensory impressions and to the concept of manual, ocular, articulate movements which mutually release themselves, get organized and develop in conformity with the symbolic values which they have acquired.

In the process of dissolution voluntary execution is found defective when automatic acts may still function normally. The question, as far as aphasia is concerned, is not which elements but which uses of speech are affected by a lesion. The author then discusses the different uses of speech. A large part of volume I, 85 pages, deals with optic agnosia and contains among others a discussion of the publication of Goldstein and Gelb. Then follows an analysis of a case of pure alexia. Two chapters on congenital dyslexia and acoustic agnosia terminate this volume.

The second volume, of 107 pages, is dedicated to the analysis of apraxia, understood as a loss of voluntary or propositional gestures. The theories of Liepman, Pick, Charles Foix and von Monakow are thoroughly discussed and at the end the relation of apraxia to aphasia is analyzed. The author finally arrives at the very concept from which he started in discussing the jacksonian concept of aphasia, e. g. that apraxia does not conform to the body anatomy but to the different conditions under which actions are performed. One should distinguish an apraxia integrated in a disturbance of the equilibrium, an apraxia as a part of a disturbed left-right and body orientation, an apraxia as part of a sensory agnosia, particularly an optic one, an apraxia as part of an aphasia and an apraxia of the type seen in dementia. Two cases of apraxia are analyzed in detail.

Handbook of Industrial Psychology. By May Smith. Cloth. Price, $5. Pp. 304. New York: Philosophical Library, Inc., 1944.

This is a useful, comprehensive book whose author has had much experience. It discusses fatigue, the environment with relation to light, temperature, noise and hours and the relationship of the individual worker to the group around him. There are also chapters on vocational guidance and selection and training and on time and motion studies. Another chapter deals with the nervous temperament and expressions of nervousness in work. Also included in the general content are discussions of accidents, grievances, misfits, sick absenteeism and labor wastage and comments on methods of investigation. In these times, so much is said and so much written concerning industrial medicine, comprehensive medical plans for workers and their dependents, hospitalization schemes and similar topics that it is most beneficial to be able to refer to a publication which deals with the basic factors influencing the reactions and conduct of industrial workers. These factors are universal and arise either out of environment or out of the reactions of one human being on another. They are commonly disregarded, often by those who talk loudest about medical care for workers, and it is to be feared that there are many who are active in the field of industrial medicine and industrial relations to whom this book would come as a revelation. This handbook is based on British experience but basically it is applicable anywhere. It is well printed, the type is large enough to make reading easy, and it is to be hoped that it will have a wide circulation among those who are engaged in an administrative capacity in personnel and medical departments in industry.

Elements of Bacterial Cytology. By Georges Knaysi, Professor of Bacteriology, Cornell University, New York. Cloth. Price, $3.50. Pp. 209, with 101 illustrations. Ithaca, New York: Comstock Publishing Company, Inc., 1944.

This is a detailed and critical treatment of bacterial structure. The author, who has an exceptional background in physical chemistry in addition to cytology, has avoided and revealed many pitfalls in a difficult subject. He has drawn on recent knowledge gained with the electron microscope. The medical bacteriologist will be disappointed, however, to find almost no use made of the great contributions of immunochemistry and the chemistry of pathogenic bacteria to the composition of the bacterial cell wall and capsule. It is regrettable too that the treponemes are described as possessing axial filaments and no flagella; recent work with the electron microscope has shown both these accepted beliefs to be in error. The specialist and graduate student in general bacteriology will find in this book critical insights into bacterial morphology and the structural basis of bacterial function and, in addition, many problems in need of critical review.

Combined Textbook of Obstetrics and Gynæcology for Students and Medical Practitioners. Revised by J. M. Munro Kerr, LL.D., M.D., F.R.F.P. & S., and others. With additional contributions by Charles McNeil, M.A., M.D., F.R.C.P., Professor in Child Life and Health, University of Edinburgh, and G. Jackson Wilson, M.B., D.P.H., Radiologist, Glasgow Royal Maternity Hospital and the Victoria Infirmary, Glasgow. Fourth edition. Cloth. Price, $12. Pp. 1,208, with 511 illustrations. Baltimore: William Wood & Company, 1944.

This edition is the fourth one which has appeared during the last twenty-one years. Like its predecessors, several of the leading British obstetricians and gynecologists are contributors. There is rarely any mention of authorship of a chapter; hence presumably each chapter was discussed by all or several of the contributors. For the first time a section on contraception is included.

In the opinion of the reviewer the following are faults in the book: In the discussion of young human ova, the Miller ovum is still regarded as the youngest despite the fact that Hertig and Rock recorded a much younger and thoroughly studied ovum; the Hertig-Rock studies were reported in 1942. Among the biologic tests of pregnancy space is devoted to such antiquated and discarded tests as Abderhalden's serum reaction, the sugar tolerance tests, the phlorhizin test, the epinephrine test, complement fixation tests and blood sedimentation tests. The authors advise against long motor or train journeys in spite of the fact that during the last few years large numbers of pregnant wives of men in the armed forces have traveled thousands of miles under the most trying conditions with practically no harm to themselves or their babies. In cases of septic abortion, emptying of the uterus is advised and, while the results are good, most American obstetricians believe that it is safer to avoid surgical intervention in infected cases of abortion. Likewise exception may be taken to the use of glycerin, pituitary extract and ergot in these cases. In the chapter on analgesia and anesthesia there is no mention of caudal anesthesia. This will astonish many of the stanch advocates of continuous caudal anesthesia and the editors of some of our popular lay magazines. The authors properly condemn the Walcher position, yet they waste an illustration on it. In the illustration demonstrating an episiotomy a lateral incision is shown, but this is the least satisfactory of all the types of episiotomy. There is a section on intrauterine douches for various purposes, but few obstetricians or gynecologists in the United States use intrauterine douches. For replacing a retroflexed uterus the authors describe and illustrate replacement with a uterine sound. This procedure carries too much risk to be recommended to general practitioners.

In spite of the foregoing criticisms, the book is full of useful information about obstetrics and gynecology. It is well written and abundantly illustrated. It will undoubtedly and deservedly continue to be one of the most popular books in England.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

STERILIZATION OF OBJECTS CONTAMINATED WITH TUBERCLE BACILLI

To the Editor:—**One of the things that deserves more attention about tuberculosis sanatoriums is the matter of sterilization of the products of patients' handiwork. Information on this subject is certainly not as widespread as it should be, even in tuberculosis institutions. Tuberculosis usually spreads by inhalation of bacilli expectorated by a patient, but the possibilities of contraction by indirect contact cannot be neglected, particularly in the case of toys or other articles made by patients for the use of small children. Dry cleaning is advised to deal with woolens contaminated with tuberculous sputum, but I can find no authority stating that naphtha, gasoline or carbon tetrachloride will definitely kill tubercle bacilli. If not these agents, what part of the dry cleaning process sterilizes the cloth? As steam sterilizing or boiling ruins woolens, we must trust to dry heat in some cases. What temperature will woolen garments stand of dry heat without deterioration, and how long should woolens be subjected to a suitable dry temperature for sterilization? What are the specifications for sterilizing mattresses in a tuberculosis sanatorium? In the case of cotton or kapok filled toys covered with cotton or wool and unable to undergo wetting, what degree of dry heat should be used and for how long? Would formaldehyde vapor be injurious to wool, cotton or furs or the dye therein? How long should articles be subjected to formaldehyde vapor for sterilization? What solution is used by bottlers to sterilize bottles for carbonated beverages? Is this efficacious in destroying tubercle bacilli? Is it injurious to cloth?**

B. J. Terrell, M.D., Nopeming, Minn.

ANSWER.—The department of bacteriology of a medical school subjected standard strains of Staphylococcus aureus and Eberthella typhi to Stoddard solvent for the same time that clothing is in this solvent during the cleaning process. All the organisms were killed. A pure culture of tubercle bacilli was then treated in like manner and the sediment was inoculated into guinea pigs. To date no sign of infection has developed in these animals. Other strains of tubercle bacilli are to be subjected to the same treatment, after which the final report will be published. As far as can be determined at this time, the dry cleaning process described serves to destroy tubercle bacilli.

Dry heat may be applied to ordinary woolens at a temperature of 250 F., and to carbonized woolens at 230 F. for a few minutes to one-half hour without damaging the material. Thirty minutes of dry heat to this degree is adequate to destroy tubercle bacilli. (Any heat over these temperatures tenders the cloth and drys up the dye oils and grease.)

The sterilization of mattresses by dry heat is effective. Laundering is satisfactory for cotton materials as, if color fast, they can be subjected to hot water. In the case of cotton or kapok filled toys covered with cotton or wool and unable to undergo wetting, dry heat should suffice; in fact, cotton tolerates a temperature of 400 degrees, which also is harmless to kapok.

The use of formaldehyde vapor for sterilization is falling more and more into disfavor. Rosenau states that none of the gases can be depended on to disinfect clothing, bedding or fabrics. While formaldehyde is suitable for general use, it does not accomplish more than a surface disinfection, as it ordinarily possesses small powers of penetration. Large quantities of formaldehyde vapor are lost by uniting with the organic matter of fabrics, especially woolens, which further hinders its penetration.

For a number of years the American Bottlers of Carbonated Beverages made investigations concerning the causes of spoilage. They found that by far the most important causes of biologic spoilage of beverages are yeasts. Bacteria are not so important because they are sensitive to citric acid, do not grow in sugar concentrations favorable to yeasts and are checked or entirely prevented from growing by moderate quantities of carbonic acid. The molds rarely cause spoilage. Much investigation led the American Bottlers of Carbonated Beverages to the recommendation that unclean bottles be exposed to a 3 per cent alkali solution, of which not less than 60 per cent is caustic (sodium hydroxide) for a period of not less than five minutes at a temperature of not less than 130 F. or an equivalent cleansing and sterilizing process. While this is probably adequate to destroy tubercle bacilli, an extra five or ten minutes is suggested to insure safety. In one large bottling plant a commercial powder, consisting of sodium hydroxide and trisodium phosphate, is used in a 3.5 per cent solution. The bottles are kept in this for fifteen minutes, with a temperature ranging from 130 to 150 F. This procedure should be entirely adequate to destroy tubercle bacilli. In the state where this concern operates there is a requirement that washed bottles contain less than 100 bacteria per bottle. However, numerous tests of washed bottles by the aforementioned method have shown an average of only 6 or 7 bacteria per bottle, none of which were pathogens except Staphylococcus aureus. These probably reached the washed bottles through the air. There is no report available of tubercle bacilli having been recovered from washed bottles.

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EXCRETION OF SULFONAMIDES AND GLOMERULONEPHRITIS

To the Editor:—**What is the effect of glomerulonephritis on the excretion of the sulfonamides? What information is available on "sulfonamide block" as pertaining to the kidney?**

Lloyd J. Netto, M.D., West Palm Beach, Fla.

ANSWER.—The question is rather ambiguous. If a glomerulonephritis already exists, it can be anticipated that excretion of the sulfonamides will definitely be inhibited and blood levels of these compounds will be maintained at a greater height than if there was no renal involvement. On the other hand, if the only consideration is that glomerulonephritis might result from the use of the sulfonamides it should be pointed out that sulfanilamide has been used successfully in the treatment of acute hemorrhagic (glomerular) nephritis. Sulfapyridine and sulfathiazole, and probably sulfadiazine, should not be employed in the treatment of an infection with an accompanying nephritis. Sulfapyridine and sulfathiazole may injure the kidneys either through intrarenal precipitation of crystals or by a direct action on the kidney cells. Sulfadiazine produces kidney damage only to a limited extent. Under any circumstance, until more definite information has been obtained, if sulfadiazine is used when glomerulonephritis is already present it should be accompanied by sufficient sodium bicarbonate to keep the urine alkaline.

An excellent account of the renal complications following sulfathiazole therapy by Winsor and Burch appeared in THE JOURNAL, April 18, 1942, page 1346. A more recent article is that of Vilter and Blankenhorn in THE JOURNAL, Nov. 11, 1944, page 691.

Even in the presence of a glomerulonephritis, were the indications sufficiently pronounced to warrant the use of sulfadiazine this sulfonamide salt should be given with the reasonable certainty that crystalluria will not develop if adequate sodium bicarbonate and fluids sufficient to bring about a daily output of 1,500 cc. are given.

SULFONAMIDES NOT USEFUL IN POLIOMYELITIS

To the Editor:—**Is there any evidence that the sulfonamide compounds have a detrimental effect in acute anterior poliomyelitis? Is the rapidity of the extension of paralysis or the extent thereof affected by these drugs?**

M.D., Puerto Rico.

ANSWER.—Extensive work has been done on the effect of sulfonamide therapy on experimental poliomyelitis in mice (Kramer, S. D.; Geer, H. A., and Szobel, D. A.: The Chemoprophylactic and Therapeutic Action of a Wide Variety of Chemical Compounds on Two Neurotropic Virus Infections in Mice, *J. Immunol.* **49**:273 [Nov.] 1944). These workers, using some forty-eight derivatives and compounds of the sulfonamide group, were unable to demonstrate any ameliorating effects on the course of the disease. These workers do not mention any definite deleterious effects in the animals subjected to this type of therapy.

STERILIZATION OF LOCAL ANESTHETICS FOR USE IN EYE

To the Editor:—Please give me information on sterilization of eyedrops for local anesthesia to be used in cataract operations. Is there any solution in which cocaine, atropine, physostigmine or pilocarpine can be dissolved which is self sterilizing? S. F. Goldfain, M.D., Baton Rouge, La.

ANSWER.—Eyedrops are best sterilized by heat. The dropper and the container must also be sterilized. The dropper and a small flask containing the solution may be placed in a small glass jar, such as is used for preserving fruits; this should be autoclaved ten minutes under 20 pounds of steam. In the solution it is well to incorporate a bacteriostatic agent aimed to keep the solution sterile. The universal bacteriostat (an antiseptic as distinguished from a germicide) for solutions of alkaloids is chlorobutanol in a strength of 1 to 0.5 per cent. The chlorobutanol should not be relied on to sterilize a solution as is shown by the following experiment: One drop of a culture of Staphylococcus aureus was dropped into a bottle of water saturated with chlorobutanol. After one, two and three hours samples were tested and there was copious growth, showing that the chlorobutanol did not kill the staphylococci. Another method of sterilizing the solution is to boil the water and while it is boiling add the alkaloid, which can be obtained in tablet form for easy measurement, after which it need not boil more than half a minute.

Precautions: Some of the alkaloids, especially cocaine, are decomposed by heat. If the solution is carefully kept acid p_H 4.5 (which is the p_H when cocaine is dissolved in distilled water without any addition), very little decomposition will take place, but if the solution is even slightly alkaline the cocaine will be rapidly decomposed. It is not safe to use chlorobutanol to sterilize the solution, and if other more powerful antiseptics are used, to be effective they must be in such strength that they will be decidedly injurious to the epithelium of the eye. These include zephiran, which should not be stronger than 1:3,000, and metaphen, which is marketed in the strength 1:2,500 to be diluted with equal parts of water to make 1:5,000. Metaphen comes buffered to a p_H of 7 plus and is therefore much too alkaline for use with cocaine. The cocaine solution should not be reheated over and over because it will become decomposed. Therefore only small quantities should be prepared at one time.

ROCK WOOL NOT CAUSE OF PNEUMONOCONIOSIS

To the Editor:—In the more recent installation of refrigeration in numerous war plants, I have observed in several patients a condition apparently caused by inhalation of rock wool and other fine particles passing into the lung proper. Please give the diagnosis, prognosis and treatment of such a condition. W. A. Newton, M.D., Beaumont, Texas.

ANSWER.—Information on the chronic pathologic effects of inhaled rock wool is practically nonexistent. Fibers of glass wool are not inhalable, and it is assumed that rock wool is likewise excluded from the lungs because of the size and physical properties of the fiber. X-ray films of persons exposed to this material tend to confirm the inference, for none of those observed in any way resemble the reaction to the known fibrous dust asbestos. If there is any change noted at all it is limited to an exaggeration of the normal linear markings due to particles and broken fragments of the fiber; such changes are rarely associated with symptoms or disability. Diagnosis would depend on a history of exposure over periods measured in years, the demonstration of a uniformly altered x-ray pattern in a considerable group of workmen and a physical examination for evidence of disability. The prognosis should be good, and no disability or increased susceptibility to pulmonary infection is likely. Treatment is entirely prophylactic.

BAR'S SYNDROME, OR COLIBACILLOSE GRAVIDIQUE

To the Editor:—I have a patient on whom a diagnosis of Bar's syndrome, or colibacillose gravidique has been made. De Lee's textbook seems to be the only one that mentions it. The *Quarterly Cumulative Index Medicus*, starting in 1920, lists references only to foreign journals. The patient is a primipara in her ninth lunar month who has had spiking fever, pyelitis and jaundice since July 1944. She had appendicitis in July. What information is available on this disease, especially as to prognosis and treatment? W. J. Schecter, M.D., Indianapolis.

ANSWER.—In De Lee-Greenhill's "Principles and Practice of Obstetrics" (ed. 8, Philadelphia, W. B. Saunders Company, 1943, p. 509) appears the statement:

"Bar has called attention to a syndrome of pain in the region of the gallbladder, the ureters and the appendix, with occasional fever, the pathologic basis being a cholecystitis, ureteritis and appendicitis. He calls it 'colibacillose gravidique.' This is a not rare condition in pregnancy. Bacteriuria accompanies it (Vignes)."

The Vignes reference is to a book, but while the Bar syndrome is mentioned in the book the original Bar reference is not given. Likewise, in a book entitled "Pratique obstétricale" (Paris, Masson et Cie., 1935, p. 11) L. Devraigne speaks of the Bar syndrome and, instead of giving the original Bar reference, quotes Tarnier and Vignal and Budin as his sources. Devraigne says that because of the constipation which is common in pregnancy the colon bacilli can gain access to the blood and produce a bacillemia. The latter has three sites of predilection, the gallbladder, the appendix and the renal pelvis. In the puerperium the Bar syndrome may simulate puerperal infection. P. Desgeorges (*Rev. gynéc. et obst.* **34**:335, 1936) speaks of a colibacillemia due to infection of the lymphatic system by the colon bacilli from the intestine.

As is evident from the foregoing quotations, the French obstetricians have been strongly impressed with the idea that colon bacilli can invade the blood or lymph stream and produce trouble. A search of the *Quarterly Cumulative Index* as far back as 1916 failed to reveal Bar's original paper, if there was one. Likewise no cross reference to it could be found.

Devraigne recommended disinfection of the intestinal and urinary tracts with cultures of lactic acid because, he said, these cultures create a pathogenic medium for colon bacilli. He also suggested the use of collargol, autovaccines, serum, bacteriophage, methenamine and a vegetable diet. Today it is recognized that most of this therapy is not only useless but also unnecessary. The sulfonamides, especially sulfathiazole, offer the most promising line of treatment.

LIGATION OF EXTERNAL CAROTID FOR INTRACTABLE EPISTAXIS

To the Editor:—In 1940 I did a ligation of the right external carotid artery to control an intractable unilateral right epistaxis. This procedure was decided on only after all other measures had failed; anterior and posterior tamponade, local and general styptics, cauterization, blood transfusions and, in an endeavor to visualize the bleeding vessel, a submucous resection had all been tried. The patient, a man aged 67, hypertensive with pronounced sclerosis, continued to bleed until almost exsanguinated. Ligation of the right external carotid artery was done under local anesthesia, and the epistaxis was immediately and permanently controlled. During the past month the patient has had several slight hemorrhages from the left nostril. Naturally he is apprehensive after his unpleasant experience and is even now anticipating a ligation of the other external carotid. Would there be any contraindication to such a procedure should the necessity present itself? M.D., Ohio.

ANSWER.—There should be no contraindication to ligation of the left external carotid artery if this procedure becomes necessary. In performing the ligation it might be well to consider placing the ligature above the facial artery branch to insure adequate circulation to the structures below the facial artery supply.

ENCEPHALITIS

To the Editor:—A woman aged about 60 has virus encephalitis. Examination of the spinal fluid showed on Aug. 7, 1944 globulin 2 plus, 17 white blood cells, 92 per cent lymphocytes, total protein 117, colloidal gold test negative, on August 21 globulin 1 plus, 23 white blood cells, 75 per cent lymphocytes, total protein 186, colloidal gold 0001232100, on September 15 globulin slightly positive, 18 white blood cells and sugar 50 mg. per hundred cubic centimeters. What is the latest treatment for this? Fred R. Isaacs, M.D., Lawrence, Kan.

ANSWER.—The diagnosis of virus encephalitis seems doubtful in this case in view of the relatively low cell count and protein and the apparently sporadic incidence. The spinal fluid picture is compatible also with brain abscess or infarction.

There is not any generally accepted treatment for such cases. If the patient suffers from a sporadic encephalitis or encephalopathy of the white matter of the brain there is a fair outlook for spontaneous improvement. If the disease has attacked the spinal cord and the bladder is involved, tidal irrigation should be instituted. Foci of infection should be sought and eradicated.

SIGNIFICANCE OF NYSTAGMUS WITH CALORIC TEST

To the Editor:—A patient gave no response to the caloric vestibular test and a diminished response by the Bárány rotating test. Could such reactions ever be considered hysterical in nature? This patient had certain manifestations of hysteria, but he also had meningovascular syphilis. Could lack of response to the caloric vestibular test be produced by hysteria? Major, M. C., A. U. S.

ANSWER.—As the nystagmus occurring with a positive caloric test is the result of impulses through nerve pathways in the brain stem independent of the cerebral cortex, a true hysteria would not be expected to have any influence on the caloric vestibular reaction. Hysterical deafness does occur as the result of suppression of consciousness of the impulses which reach the cerebral cortex.